The Plough, the Loom, and the Anvil.

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HEAR BOTH SIDES.

WE invite the particular attention of our readers to the following statement of *facts* furnished by the commercial correspondent of the Washington *Union*, with a view to prove the superiority of the system of 1846, which looks to the exhaustion of the land and its owner, over that of 1842, which looks to bringing the loom and the anvil to the side of the plough and the harrow, thus making a market on the land for its products, and enriching the land and its owner. Having studied it carefully, we invite them next to study *the real facts* that we shall lay before them, and then to judge of the merits of a cause requiring for its support so unblushing a violation of truth as is here exposed:

"It is when the people of a country *consume* more of the produce of their own labor that their prosperity is greater. Take cotton in the year 1850. The quantity of cotton consumed in the United States was reported at 598,269 bales, which, at 400 lbs., gives 239,307,600 lbs., or very nearly the quantity consumed in Great Britain in 1832. Under the protective system, at the usual estimate of three yards to the pound, the produce in the two countries, with the quantity exported, will stand thus:

	Pounds consumed.	Equal to yards.	Yards exported.
England, 1832,	259,412,463	778,237,389	668,044,503
United States, 1850,	239,307,600	717,922,800	94,888,480

"The number of yards exported from the United States is not given officially, but the value in 1850 was $4,744,000, which, at twenty yards to the dollar, gives the number of yards in the table, from which, if we deduct the yards of foreign manufacture consumed, there remains nothing. So that while England *exported* ninety per cent. of her production, the United States *consumed* the *whole* of an equal quantity produced. The progressive consumption of cotton in the United States is thus displayed:

	Cotton consumed, pounds.	Value exported.	Value imported.
1842–46, - -	593,390,400	$13,995,739	$43,172,559
1846–50, - -	1,123,218,800	16,468,178	64,931,291
Increase, - -	429,828,400	$5,472,439	$21,758,732

"Thus, then, the quantity of raw cotton taken for consumption has increased seventy per cent., the import of foreign cotton fifty per cent., and the export of domestic cotton forty per cent. In the four years of the present tariff, therefore, the consumption of cotton goods has increased in the United States probably to nearly as great an extent as iron, of which the consumption of the home manufactured article has increased perhaps more than any other. In the United States, the freedom from internal restraints upon intercourse, and

modified restrictions upon foreign trade in the last four years, have permitted the people—the workers—to consume a larger portion of the products; and it was hoped from the revolution that France would experience also a commercial emancipation, which should, by permitting her people to consume more, and capital and office-holders less, confer greater remuneration upon every branch of industry. That this will be the case—that France, under universal suffrage, extended education, and commercial emancipation, will become an important customer for United States produce—there is every hope."

"It is," says our author, "when a people *consume* more of their products that their prosperity is greater." We are thus offered a test by which to try the different systems, and if we cannot show that the people *consume* more under the system which looks to making a market on the land for all the products of the land, than they do under that which teaches that the farmer should exhaust his soil and waste his capital by sending all the produce of his land to distant markets, we shall hold ourselves ready at once to abandon the cause of the farmers and planters, and undertake to teach our readers the advantage of impoverishing themselves for the maintenance of the fleets and armies of England, as is now being taught by the *Union* and its contributors.

The readers of that paper are here assured that under the tariff of 1846, the consumption of cotton has increased *seventy per cent.* Of the value of such statements, and of the strength of the cause which needs such falsification, our readers will judge, when they shall have examined the following account of the growth of the domestic consumption, drawn from the highest and most authentic sources:—

In the last year of the Compromise tariff it had been only - bales	267,850
It had grown in 1846–7 to about - - - - - - - -	470,000
And in the following years, 1847–8, during which the potato rot and British railroad speculation had rendered the tariff of 1846 totally inoperative, it reached a total, North and South, of - - - -	606,000
Thenceforward the progress was arrested, for the destructive tariff of 1846 had become operative. The total consumption, North and South, of 1848–9, is stated in the *New-York Shipping and Commercial List*, at - - - - - - - - - - -	618,039
That of 1849–50, at - - - - - - - - - -	595,269
And that of the year 1850–51, just closed, may be set down, on the same authority, at - - - - - - - - - -	464,168

The *Northern* consumption of 1844–5 was 389,000 bales, while that of the past year has been but 404,000, and thus has it gone back almost to the period at which it stood six years since. That of 1848–9 was 518,000 bales, and thus has it gone back from the point at which it stood two years since, to the extent of 114,000 bales, when it should have doubled.

The Southern and Western consumption of 1848–9 was estimated at 110,000 bales, and that of the following year at only 107,500; whereas it is now but little more than one-half, or *only sixty thousand*, and the total is less than that of the last year of the tariff of 1842—that of 1846–7—although there has been a growth of population amounting to *fifteen* per cent.; and yet our author gravely assures his readers that under the tariff of 1846 the domestic consumption of cotton has grown seventy per cent. It is really to be regretted that persons having any claims whatever to character should put forth statements so utterly fraudulent.

From 1842–3 to 1846–7 the domestic consumption grew from 267,000 to almost half a million of bales, being an increase of above eighty per cent. while the population grew about thirteen per cent., and thus the increase of the former was six times more rapid than that of the latter. From 1847–8, when the tariff of 1846 began to become operative, it has fallen from more than 600,000 bales to less than half a million in 1850–51, a period of three years in which population has grown about ten per cent., whereas an

increase similar to that observed under the tariff of 1842 would have carried it up to little short of a million. The power of a people to *consume* their own products having been established by our author as a test of their prosperity, we would desire him to explain how it was that that power grew with so rapid a growth under the tariff of 1842, and how it has been that it has so rapidly declined under that of 1846—instead of increasing seventy per cent., as he would have his readers to believe has been the case.

Desiring to satisfy our readers in regard to the manner in which the tables of our author are manufactured, and thus to convince them of the fact that these British free-trade statements are not in any manner to be relied upon, we invite them to an examination of the following facts. In the first place, the consumption of 1849–50 is given by the *Union's* correspondent as that of 1850, to the exclusion of that of the year 1850–51 now just closed, and the reason for so doing is that it is only now that the operation of the tariff of 1846 is becoming most fully obvious in the closing of the mills and furnaces of the Union, and in destroying the power of consumption, the true test of prosperity By taking the one year he obtained, as our readers have seen, the quantity of 598,269, whereas, had he taken the consumption of the crop of 1850, he would have obtained one of only 464,168. That, however, would not have suited his purpose.

Again, the consumption of 1842 to 1846 is, as is seen, put down at	593,390,400 lbs.
And that of 1846–50 at - - - - - - - - - -	1,123,218,800 "

Being thus given in the lump, few readers can detect the falsity of these statements, and therefore do we desire particularly to call to the following figures the careful attention of our readers.

The consumption of	1842–3 was - - - - - - - - -	325,000
"	1843–4 " - - - - - - - -	347,000
"	1844–5 " - - - - - - - -	389,000
"	1845–6 " - - - - - - - -	453,000
		1,514,000

At *four hundred pounds* per bale, this would give about six hundred millions, or nearly the quantity set down by our author.

The consumption of	1846–7 was from - - - - - - - -	470,000
"	1847–8 " - - - - - - - -	606,000
"	1848–9 " - - - - - - - -	618,000
"	1849–50, here set down at - - - - -	598,206
		2,292,206

At *five hundred pounds* per bale, these would give 1,146,103,000 pounds, or very nearly the quantity set down by this advocate of the maintenance of the British monopoly. It would thus appear that in order to obtain the desired superiority of the one system over the other, *twenty-five per cent. has been added to the weight of the bales*, and in no other manner can the amount be obtained; for the number of bales consumed is here given, except in the single case in which we have taken our author's own figures, on the highest authority in the Union.

This, however, is not all. The tariff of 1846 came, nominally, into operation in December, 1846, although its real effects had scarcely commenced even two years afterwards. To cover the ground, the year 1845–6 is set down as 1846, and 1846–7 is transferred to the new account. It is, however, well known that every mill at work in 1846–7 had been built in 1846 or earlier, and that scarcely a single one was in operation even in 1847–8 that had not been commenced to be built before December, 1846. Equally well is it known that the crops which paid for the consumption of 1847 were raised in 1846, and that, therefore, for every reason, the true place for 1846–7, and even for 1847–8, is under the tariff of 1842; but this did not suit the purposes of our author. It was necessary to

give from June, 1846, to June, 1847, constituting the fiscal year 1846–7, to the tariff of 1846, and so he has done.

Again, the consumption grew upwards from 1843 to 1847, and from 1848–9 it has grown downwards, proving that the power to consume grew under protection, and that it has diminished with the withdrawal of protection—thus:—

CULMINATING POINT.

1847–8—606,000
1848–9—618,000

1846–47—470,000	1849–50—598,207
1845–46—453,000	1850–51—464,168
1844–45—389,000	1851–52—
1843–44—347,000	1852–53—
1842–43—325,000	1853–54—

To state the facts thus would have been conclusive against the policy of the tariff of 1846, and therefore it became necessary first to appropriate—we were disposed to use a harsher word—the whole consumption of the crop of 1846 and that of the crop of 1847—next to add twenty-five per cent. to the weight of the bales—and then to take the averages, thus setting off the year of exhaustion, 1842–3, when the free-trade provisions of the Compromise had produced universal ruin, against the prosperous years 1846–7 and 1847–8, when protection had brought up the consumption of iron from three hundred thousand to almost a million of tons! A system of fraud so universal as that practised by our free-traders, whose every thought is given to the maintenance of British *monopoly* as a certain means of reaching *free trade*, has rarely, we think, been seen. Scarcely an honest figure comes from any one of them, so far as we have an opportunity of judging of their statements. If they talk of the tariff of 1846 and its effects upon the power of production or consumption, they use false figures, and apply a magnifying glass even to them. If they talk of the same effects as observed in the working of the tariff of 1842, they commence by using false figures, and then reverse the glass that even they may be diminished. Such are the practices of the men who denounce as an "exploded fallacy" the doctrine of Adam Smith, that the farmer and planter are to be enriched by making a market on the land for all the products of the land.

Their consciousness of the error of the system which looks to the maintenance of the British monopoly, is clearly proved by the mode in which their tables are invariably arranged. The advocate of the American system prefers in all cases to take the latest years of protection, because as the system becomes operative its benefits become from year to year more obvious; and thus it is that 1845–6 is preferred to 1844–5, and 1846–7 to any of the previous years of the existence of the tariff of 1842. They never manifest a desire to include 1841 or 1842. With their opponents the case is directly the reverse. They prefer the early years to the exclusion of the later ones, because from year to year the evils of their system become more manifest, and thus it is that they insist on impressing 1846–7 into the service of the tariff of 1846, while excluding 1850–51. If their doctrine were correct, they would find trade gradually increasing as their tariff became more operative, and the last year should far exceed the first, and they would be as anxious to exclude 1845–6, the last of the years of protection, as the advocates of protection are to exclude 1842, the last of the years of free trade. In the fact that they invariably claim the last year of protection as a year of free trade, and then seek to make up the deficiencies of other years by taking averages, may, as we think, be found conclusive evidence that they are fully aware of the destructive character of their system.

In 1846 we were assured that protection enhanced the prices of commodities to the whole extent of the duty, and that by adopting free trade our exports would increase so much that our farmers and planters would be so greatly enriched that they would

become greater consumers of all the commodities needed for their comfort and enjoyment. It is clear, however, that so far as the power to consume is manifested by the production of domestic cottons, the reverse is found to be the fact, and we are steadily losing all that we had gained in the period in which the farmers and planters were protected in their efforts to attract the loom and the anvil to the side of the plough and the harrow. This, however, is not all. Diminished as is our power of production, that of consumption has diminished even more rapidly, as is shown by the increased necessity for seeking abroad a market for the products of our spindles and our looms. We have not before us a statement of the quantity of domestic cotton goods exported, nor of their annual value, and must therefore depend upon the figures of our author, suspicious as we, in all cases, hold them to be. From 1842 to 1846, the total value exported he sets down at $13,995,739, giving an average of three millions and a half of dollars per annum, and at that time a dollar would give perhaps fifteen yards, making the export somewhat over fifty millions of yards. In the years 1849–50, the export is set down at little short of a hundred millions of yards; and from various statements we have seen, we are disposed to think that that of 1850–51 has been still greater. Admitting it, however, to have been no more, we have a diminution in the manufacture of cotton to the extent of a hundred and fifty thousand bales from the height to which it had been carried during the existence and under the influence of the tariff of 1842, while the export of the cloth made from that cotton has almost doubled. It is clear, therefore, that the consumption of cloth declines even faster than the production. How far the deficiency is made up by importation we may now examine.

In 1840 we imported but twenty millions of yards of cotton goods, being only one third as much as we had imported nine years before, in 1831, under the highly protective tariff of 1828. In 1842–3 it fell to less than nine millions. In 1845–6 the quantity had quaprupled, the number of yards of plain and printed calicoes imported having been 36,800,000. The quantity exported to this country in the first six months of 1850, as given in Burns's Commercial Glance, the highest authority, was 39,571,000 yards, and with a similar import for the second half year, the total quantity would be about eighty millions, giving an increase of forty-four millions in the import against an increase of fifty millions in the export, and the weight of the additional cloth exported was probably double that of the additional cloth imported. It is obvious, therefore, that even in that year there was a very large decrease in the domestic consumption of cottons, foreign and domestic, notwithstanding a considerable increase of population.

The first six months of the present year are given in the same document at 27,650,000 yards, giving probably for the year a total of fifty-five millions of yards, to set off against an export of almost a hundred millions; from which it would appear that our present total consumption must be greatly less than half a million of bales, although of the crop of 1847 we not only worked up - - - - - - - - - - 606,000
but we consumed of foreign cottons, over and above the export of domestic ones,
not less than - - - - - - - - - - - - - - 25,000

Total quantity, - - - 631,000

And that therefore, notwithstanding the great growth of population, the consumption has fallen about twenty-five per cent., *or one hundred and sixty thousand bales.* Nevertheless, our author, by dint of selecting his years and increasing the weight of the bags, was enabled to exhibit an increase of seventy per cent.!

We now most particularly desire to call the attention of our readers to the fact, that the import of cotton goods grew rapidly under the tariff of 1842, and that in the years 1845–6, when the manufacture was rapidly growing, the value imported was $13,500,000, or within $1,680,000 of the import of 1848–9, when the manufacture had become stationary. In the following year, 1849–50, there was an increase of more than four millions of dollars to set off against the fact that the domestic consumption of cotton, instead of increasing, had declined twenty-five thousand bales, capable of producing five millions

of dollars' worth of cloth; but it has not been until the present year that the full effect of the tariff of 1846 has become obvious in the rapid decrease of domestic production, attended by a rapid decrease of the power to consume cloths of any description, either foreign or domestic. The falling off in the present year in the export to this country would appear from the tables just now published to be about twenty-five millions of yards, and this is accompanied by a diminution in the domestic consumption amounting to more than a hundred and thirty thousand bales. If, then, when a people *consumes* most of its own products it is most prosperous, the prosperity of the country must have been far greater under the tariff of 1842, when consumption increased at a rate six times faster than population, than now when it diminishes from year to year, notwithstanding the great increase of population.

A system more utterly destructive of the interests of the planter than the present one can scarcely be imagined. The great market—the one that grows with most rapidity when *permitted* so to do—is cut down to 464,000 of bales, when it might and would have grown to a million, and the consequence is seen in the fact that the first bale of new cotton has been sold in New-York at *nine and a half cents*, when last year it would have commanded *fifteen and a half*. If producers of cotton desire to learn why this is so, let them study carefully the fact that the domestic consumption has diminished one hundred and sixty thousand bales, while we have added from two to three millions to the population.

A reduction of six cents per pound is equivalent to thirty dollars per bale; and the crop being taken at two millions and a half of bales, it follows that the total reduction is seventy-five millions of dollars; and the cost of raising being precisely the same in the one case as in the other, it follows that the power of the planter to accumulate wealth is diminished probably five sixths.

Such being the case, it would seem to be important that the planters should study for themselves the causes of such extraordinary variations in the price of their great staple, and the cause of the great fact, that while possessing almost a monopoly of the supply of it to the world, they are perpetually compelled to sell at prices so utterly ruinous, and promising to be more so, if the crop continues to grow and they continue to prevent a corresponding growth in the market for it. Desiring to enable our readers to examine this important question, we submit the following figures, to which we invite their careful attention:—

Crop of		Domestic consumption.	Left for export.	Average prices.
1838–39,	1,360,000	276,000	1,084,000	14 cts.
1839–40,	2,177,000	295,000	1,882,000	8
1840–41,	1,634,000	297,000	1,337,000	10
1841–42,	1,683,000	267,000	1,416,000	8
1842–43,	2,378,000	325,000	2,053,000	6
1843–44,	2,030,000	346,000	1,684,000	8
1844–45,	2,394,000	389,000	2,005,000	6
1845–46,	2,100,000	452,000	1,648,000	8
1846–47,	1,778,000	468,000	1,310,000	10
1847–48,	2,347,000	606,000	1,741,000	7½
1848–49,	2,728,000	625,000	2,103,000	6½
1849–50,	2,096,000	595,000	1,501,000	11
1850–51,	2,350,000	464,000	1,886,000	

How entirely the price is dependent upon the quantity to be exported, and upon the amount of power granted to the British manufacturer over the crop may be seen from the following facts:—

When the surplus for which a market was to be sought abroad was under 1,100,000 bales, the price was - - - 14 cts.
" " 1,400,000 " " - - - - - 10
" " 1,700,000 " " - - - - - 8
" " 1,800,000 " " - - - - - 7½
And whenever it exceeded 2,000,000 it fell to - - - - - 6

To this rule there are slight exceptions, resulting from the actual or supposed deficiency of previous or subsequent crops. Thus, in 1839–40, the excess was 1,882,000 bales, and the price fell only to 8 cents, because of the remarkable deficiency of both the previous and subsequent crops. In 1848–9, the surplus exceeded 2,000,000 bales, but the price fell only to 6½ cents, because of the great deficiency of the following one; and the latter was maintained at an average of 11 cents, by the most exaggerated reports of disasters to the growing crop, which could not, as it was asserted, exceed 1,800,000 bales, whereas it proved to be almost two millions and a half. With a view to eliminate, as far as possible, these causes of error, we give the average surplus for each pair of years, and the average prices, as follows:—

	Aver. surplus for exportation.	Aver. price.	Aver. surpl.	Aver. price.	Aver. product.
1838–39, and 1839–40,	1,483,000	11 cts.			
1839–40, " 1840–41,	1,609,000	9	1,490,000	9⅔ cts.	$71,500,000
1840–41, " 1841–42,	1,376,000	9			
1841–42, " 1842–43,	1,739,000	7			
1842–43, " 1843–44,	1,870,000	7			
1843–44, " 1844–45,	1,846,000	7	1,820,000	7	64,000,000
1844–45, " 1845–46,	1,827,000	7			
1845–46, " 1846–47,	1,479,000	9			
1846–47, " 1847–48,	1,526,000	8¾			
1847–48, " 1848–49,	1,924,000	7	1,682,000	8⅜	70,000,000
1848–49, " 1849–50,	1,800,000	8¾			

The crops of the second period exceeded those of the first by an average of nearly half a million of bales per annum, but the growth of the domestic consumption absorbed about 700,000 additional bales, and the consequence was that the surplus which required to seek a market abroad exceeded that of the first period by only 330,000 bales per annum; and to this it is to be attributed that the fall of prices was not much greater. The quantity grown in the four years from 1842–3 to 1845–6, and that grown in the four years from 1846–7 to 1849–50, has been almost precisely the same, to wit, 8,900,000 bales in each period; but in consequence of the growth of domestic consumption, which continued during much of this period, and a part of which is still maintained, the average quantity for which we needed to find a market abroad was less by an average of 138,000 bales in the third period than in the second, and the consequence was a rise of price to an average of 8⅜ cents. The year just closed has exhibited an increase of crop and reduction of domestic consumption, rendering it necessary to seek abroad a market for almost 1,900,000 bales, the consequence of which is now seen in the fact that prices have fallen to about the standard of the great crops of 1847–8 and 1848–9, with every prospect of a further fall unless the growing crop should prove less than has been anticipated.

We would now beg our cotton-growing readers to reflect what would have been their condition in this last period of four years, had the cotton and woollen and iron manufactures been permitted to go ahead as they were doing, and had we found it necessary to look abroad for a market to the extent of only a million and a half instead of almost seventeen hundred thousand bales, enabling them to obtain ten cents per pound, or fifty dollars per bale, and giving them seventy-five millions of dollars for the quantity exported, while giving them twenty millions additional for the quantity consumed at home, thus making a difference of at least twenty-five millions of dollars. Would not this *difference* have paid for nearly all the cloth and iron they consume? It would; and yet it constitutes but a small portion of the gain that would result to them from making a market on the land for the products of the land. Had the tariff of 1842 remained, the domestic consumption of cotton would now absorb almost a million of bales, and the price of the remaining million and a half of last year's crop would have exceeded one hundred millions of dollars. Had such been the state of things, the European would have been forced to come here to buy, instead of the planter being forced to go abroad to sell; and

the difference between the two is, that in the one case the European manufacturer would have been obliged to seek to purchase, and the planter would have fixed his price, whereas in the other the planter seeks to sell, and the English manufacturer fixes the price for himself, and for all the world. The man who *must* go to market pays the cost of transportation to market, but he who is not forced to go to market will find the cost of transportation paid by others. The way to relieve the planter from the *necessity* for seeking a market is to make a market on the land for all the products of the land, as was being done by the tariff of 1842. The way to deprive him of the *power* to determine where he will buy, or where he will sell, is to close the mills and furnaces and mines of the country, as is now being done by the tariff of 1846.

In our next we shall lay before our our readers a further specimen of the truthfulness of the statements of this correspondent of the *Union;* but before proceeding farther, we desire to call their attention to the extraordinary absence of any thing like consistency in the views of these admirers and supporters of the system by aid of which Great Britain seeks to secure to herself a monopoly of the manufactures and trade of the world. But a few months since we laid before them an extract from a paper by this very writer, exhibiting in full relief the absurdity of this monopoly system, as follows:—

"What a strange absurdity it is to see silk going from China and France, cotton from the Southern United States, wool from Australia, coffee and sugar from Brazil, wheat from New-York, Michigan, Odessa, and Poland, hemp and flax from St. Petersburg, pork and lard from Ohio and Illinois, concentrating in Lancashire, to be returned in goods to the localities from whence they came! Such a state of things never could have been brought about but for the geographical position of England giving her the control of the ocean."

In the columns of the *Union* we find, invariably, this same person urging upon the people of this country the advantage that must result from sending to Europe the flour, the pork, and the cotton of the valley of the Mississippi, thence to be returned, in the form of cloth, to the places from whence they came; and yet it is to him, and others like himself, that we are told to look for true politico-economical science. From hour to hour they contradict themselves, and yet they talk of "the exploded fallacies" of their opponents!

GREAT PACKING OF FLOUR.

"In Fitzhugh & Co.'s mill, at Oswego, N.Y., quite an operation in packing flour was performed one day, which, the *Journal* of that city says, is probably without a precedent. Four men, with the aid of the old-fashioned packing apparatus, in seven hours and thirty-five minutes packed six hundred and fifty barrels of flour! This includes heading-up, ready for shipping. Can any other flouring-mill equal this? None of the machines can do any thing like it."

If our readers desire to see this exceeded, we would beg to refer them to the letter of Mr. William Brown, member of the British Parliament, published in our last number, and they will find it far exceeded. Mr. B. there assures his friends that they are the greatest of all the exporters of food in the world, and that they are so *because they place the food in that wonderful compressing machine, the human stomach,* to nourish and support the men who are employed in converting the cotton and the wool into cloth, and the coal and the ore into iron, and that thus it is that they are enabled to send their food to all the world. The Illinois farmer sends his corn to market, obtaining for it fifteen

or twenty cents a bushel. It travels to Liverpool, where it sells at sixty or seventy cents a bushel, and then having been packed away according to Mr. Brown's receipt, he buys it back again at two or three dollars a bushel; and thus it is that he is to be enriched by British free trade!

ON THE AGRICULTURE OF NOTTINGHAMSHIRE, ENGLAND.

[*Continued from p.* 149.]

SECOND YEAR.—BARLEY.

Of late years it has been common, from the very low price of barley, to sow all the early cleared turnip land with wheat, either as soon as the turnips are eaten, or during the succeeding month of February. This practice appears to some persons open to objection. If half the turnip land is sown with wheat instead of barley in each year, it will in due time bring the whole of the land to produce wheat three times instead of twice in eight years, or during every two courses; and whether the weak soils of this county are capable of supporting the practice permanently is the point on which some cautious minds demur. That it is desirable for all land to have as frequent change of cropping as possible, so long as such change is attended with profit to occupiers, none will venture to deny. The respective prices of the two kinds of grain for the time being will go far to determine for or against the practice. And whilst farmers, who have made so great an outlay on their turnip crop, can, as we have known to be the case, grow forty bushels and upwards of fine wheat to the acre, instead of perhaps as much barley—worth only two thirds the price of the wheat, and with far less risk of being spoilt in the harvesting—they will not fail to regard present profit notwithstanding a contingency of future loss.

The land intended to be sown with barley is ploughed as soon as cleared of the turnips, to prevent waste by evaporation of that manure which has been left by the sheep, and also its being washed by heavy rains irregularly upon the surface. The land should then have a second ploughing before the barley is sown, as it is found to ripen more equally after two ploughings than one, and also, we think, to withstand the drought more effectually if the following summer should prove a dry one. The season of sowing seldom commences before the 20th of March, and even that is earlier than many will sow, lest the frosts should injure the plant when young. The largest breadth is sown during the early part of April; the season continues, however, up to the month of May, but the quality of the produce is mostly inferior when sown thus late. The most generally approved kinds of seed are the Welsh and Chevalier. The quantity of seed sown varies with the mode of sowing; if sown by hand, which is the practice of many, upon the common furrow, and harrowed in by the drag-harrow, from 14 to 16 pecks an acre are used; but if drilled, not more than 22 pecks are necessary.

THIRD YEAR.—GRASS SEEDS, OR CLOVER.

The grass seeds are sown most frequently at the same time with the barley, although the prudence of the custom is, we think, questionable, and has not received the consideration that it deserves. It is said that if seeds are sown thus early with the barley they take so much better than if sown latter; and the practice is, on that ground, defended, without, perhaps, at all weighing the serious injury that is occasioned to the barley by such rampant

growth of various plants at its roots. Is it not probable that the exuberant growth of clover, and its accompanying grasses, is equally hurtful to the cereal crop, whether wheat or barley, with the exuberant growth of so many weeds, if they were permitted, but which are, by all good farmers, carefully removed? Another great evil in allowing the clover to make so much head arises from the increased difficulty of harvesting well the barley crop. Now, by drilling in the barley in the first instance, and when it well covers the ground to hoe in the clover seeds, will, in our humble opinion, in most seasons be found far better as regards the grain crop, and not in the end much worse as relates to the seeds. Of red clover 12 pounds, with half a peck of rye-grass, to the acre, is generally found sufficient. For summer pasture is required of white or Dutch clover 10 pounds, with 2 pounds of rib-grass, and 2 pounds of trefoil, accompanied by 2 pecks of dwarf rye-grass.

The season for cutting the early sown barley is rarely retarded beyond the last week in July or the first in August. This is most commonly done by the scythe, which is followed by a woman, who gathers the mown corn into sheaves by means of a rake having three or four long iron teeth; she places the sheaf upon a straw band, made usually by one of the children. The man then binds the sheaves, and, as he returns to the point from which he started, the woman carries his scythe. In this manner an active family will clear five roods in the day, for which they receive from 5*s.* to 7*s.* 6*d.* an acre, according as the crop may be light or heavy, including the stooking and raking afterwards.

From the more than ordinary scarcity of pasturage which the occupier of these dry soils has to contend with during the months of August and September, he is generally obliged to stock the young clover during the autumn, and perhaps, if not eaten too low, it may be benefited by the treading of sheep, more than injured by the pasturing. It is, however, the invariable custom to clear the ground before the severe frosts come on, and to allow nothing to go upon them until the following spring, when they are required for the ewes and lambs. With these they are, in most cases, stocked; and when an allowance of half a pound of linseed-cake to each ewe is made, they will often carry five or six ewes and their lambs to the acre up to weaning time, but the number kept depends much on the moisture of the season. The red clover is generally mown for fodder for the working horses during the winter months, the after crop being reserved for the lambs when weaned. The propriety of pasturing lambs on the second crop of red clover has been much debated, as great losses frequently ensue from it; such, in particular, has been the case on some farms during the present year. It has been suggested, and we think with good reason, that the danger arises from its being done when the clover is too young, which induces flatulency and disorder of the stomach and bowels, and ends in diarrhœa, which often proves fatal to lambs at that season of the year.

It has been almost the universal practice to allow the grass seeds to remain down for pasture two years, and often longer, before the land is ploughed up for wheat. An opinion now, however, prevails in favor of ploughing it up after one year, as it is found that as much wheat can be grown after one year's seeds as upon those of longer growth, which, perhaps, may be accounted for on the ground of the fibrous roots of such seeds as are the growth of one year being sufficient for the support of the succeeding wheat crop; whereas, when of longer standing, a season commensurate is required before the roots can decompose, and become available matter for the support of other plants. The red clover is seldom allowed to remain down longer than one year,

doubtless from the circumstance of its deteriorating more than the white after that time.

FOURTH YEAR.—WHEAT.

The season for sowing wheat on the warm soils of this district commences now much later than it formerly did. Very little is sown before the last week in October, but November is the principal month for this important operation. The customary mode of preparing the ground is by ploughing and pressing the clover ley, one presser following two ploughs. There is no neater mode of performing the work when it is well done. It is, nevertheless, objected to by some good farmers, on the ground that the grass is liable to grow up between the furrows, so as to interfere materially with the after growth of the wheat. The almost universality of the practice in the district seems to furnish an argument against that objection. It has, however, been met more effectually by a plough invented some years ago by Mr. Hodgkinson of Morton Grange, which is termed a "skim-coulter plough." The advantage he proposed was, that it should take off a thin furrow from the surface before ploughing the main one: the sward would, by that means, be effectually disposed of by being thrown to the bottom of each furrow, and could not grow through to the injury of the wheat. The whole is performed by one plough, which requires four horses. Its adoption would certainly increase the labor of the wheat seed-time, but it would, at the same time, carry out a most important principle of good farming, we mean that of deep ploughing, (to which it is, undoubtedly, a preliminary step,) on almost every kind of soil. Deep drilling follows of necessity on deep ploughing, which is an object of the last consequence on soils liable to suffer from drought.

The quantity of seed sown is regulated by the quality of the soil, less being required where the soil has strength to cause it to tiller during the winter months. Few sow less than 9 pecks to the acre, and on the light soils as much as 12 pecks is sown. The amount of seed is a subject that has been too often discussed to leave room for much that is new to be said upon it. We may, nevertheless, observe that custom in this district has fixed upon about 10 pecks an acre as the most desirable quantity. If sown thick the ears will be small, and the yield, regarded individually, will be found defective. If, on the other hand, it is sown not thick enough, an increased expense is incurred in hoeing to keep down the weeds, and nature, in seeking to supply what is wanting, will continue to throw out, as the roots gain the requisite power, a succession of ears until so late in the season that it will be impossible for the crop to ripen uniformly; the inevitable consequence of which will be an undue proportion of small and defective grain in the produce.

White wheat in its several varieties is almost exclusively sown on the sands, and the one which for some years has taken precedence of all others, at least in the northern part of the county, is "Hunter's White Wheat," in favor of which so strong a feeling exists, that it is thought by many to be unequalled for this soil and climate. So great is its popularity, that it is extending its fame generally throughout the cold soils of the clay districts, on which at one time white wheat was seldom or never attempted to be grown. It is held in high request also by the millers, from whom it commands the best price. It would be difficult to give a decided opinion on the average produce of the wheat crop; but we may nevertheless state, that on well cultivated farms of ordinary quality it is seldom below 30 bushels an acre; and on the higher farmed land of good quality, not much, if any below 40 bushels.

Of barley, the fluctuation in produce is greater as the season suits it or otherwise. On the average, it may be stated at 4½ quarters, although in some instances a field will yield 7 or 8 quarters an acre.

The harvesting of the wheat crop is now more frequently done by the scythe than by the sickle. The work is performed as described in the harvesting of barley. Mowing has several advantages over reaping with the sickle. It is cheaper, far more expeditious, and clears the ground at once of all stubble and weeds. If well done, the grain is found not to suffer so much in wet weather as when reaped by the sickle, which may be easily accounted for by its being looser in the sheaf, which allows the rain to pass more easily through it. From the same cause it admits more freely the sun and wind, and is in consequence sooner ready to carry. A strong prejudice existed for some years against the practice, but it has now given way, the advantages being too decided to be any longer doubted. The price is from 6*s*. to 8*s*. per acre, and occasionally 9*s*. may be given, which includes mowing, taking up and binding the sheaves, as well as taking up and binding the rakings.

Oats are not much sown on the sand lands; a crop is sometimes taken after two years' grass seeds, as fodder for the working horses; the land being afterwards manured and sown with wheat. In general, two white crops in succession are opposed to good farming; but when the land is in high condition, and obtains an extra dressing of manure as compensation, it cannot reasonably be objected to.

Peas both white and gray are occasionally sown in the place of the red clover crop, under an impression that the land in the following course will be more certain for clover. They are drilled wide so that the horseshoe may be applied. A single crop of peas is not unfrequently taken after the wheat crop, the land being fallowed the succeeding year for Swede turnips.

Vetches are sown extensively for soiling the working horses during the summer months. Those for early mowing are sown on the wheat stubble as soon as that crop has been removed, and are protected during the winter by an admixture of rye. A succession of crops is provided throughout the season; the land, as we have before stated, is sown with white turnips as soon as it is cleared of the vetches. The most economical manner of using vetches is to cut them with a proportion of dry fodder; the horses will, when thus fed, go through their work much better, and be less liable to suffer from disorders of the stomach and bowels, occasioned by feeding too freely on them in an unmixed state, when they return hungry from their work.

On most of the large farms, the cutting of chaff for horse food is performed by horse power.

In some instances steam-engines have been erected, which, in addition to the cutting of chaff, thresh out the grain, as well as grind what is necessary for the use of the farm. Earl Spencer has had one on his farm at Wiseton for several years past. Mr. Smith, of Gringley-on-the-Hill, has lately erected a small, but complete engine, which is capable of threshing out about eight quarters of wheat an hour, and is made applicable to several other useful purposes. These, and more which might be mentioned, we doubt not will be but the forerunners of others, as the necessity for economy in every department of labor shall become more urgent.

On referring to Mr. Lowe's Report upon the State of Agriculture in Nottinghamshire in 1794, we find mention made of practices adopted at that time by certain individuals, which bespeak an intelligence and enterprise much beyond their day; as for example, the application of bones at the rate of 50 bushels an acre to the turnip crop, and of rape-dust at the rate of half

a ton an acre; those individuals possessing moreover the foresight to determine on the four course system, as the best adapted to the district, when, after so many years' experience, it has become universal. These persons had also the sagacity to perceive the great superiority of the Leicester sheep over the other breeds then known in the county, and spared no expense in bringing it to perfection. It must be confessed that such statements of the farming of fifty years back are calculated somewhat to startle us, when drawing a comparison between it and the agriculture of the present day. In carefully revising Mr. Lowe's report, however, we think it clear that the instances he there adduces of such spirit and intelligence were confined to the practices of the few, and formed little or no part of those of the many.

In every age are found persons gifted with minds superior to the mass of those around them, who, anticipating improvements, the necessity of which is not admitted by their neighbors, shape their conduct by their own convictions, indifferent to the prejudices of others.

We have no wish to become detractors from what is justly due to our ancestors of the eighteenth century; but we think that very little reflection is needed to show that their movements must of necessity have been confined within a narrow circle by the disadvantages with which they were at the time surrounded, which disadvantages must have formed an almost insurmountable barrier to any thing approaching a perfect system of farming.

When a considerable portion of the county was uninclosed, when the art of drainage was all but unknown, and at a time when the prime virtue of the husbandman was the observance of a rigid economy—far too rigid, we should imagine, to allow of that liberal investment of capital which has since proved the foundation of all the essential improvements which have taken place—with all these disadvantages, and especially the want of requisite information on subjects in general connected with his profession, on which science has since thrown light and knowledge, we cannot but infer that the agriculture of 1794 must have been, as compared with that of 1844, very defective and imperfect as a whole.

SHEEP.

The pure Leicester, or a cross of that with the larger framed animal from Lincolnshire and the Yorkshire wolds, is the general stock of the county. Nottinghamshire has long been famous for its superior breed of sheep. Mr. Lowe makes mention of the names of several celebrated breeders of Leicester rams, chiefly resident in the southern part of the county, who were, at the time he wrote, going to great expense in improving the breed of sheep; giving even at that time as much as 100 guineas for a ram. It appears from his report, that Mr. Bakewell's celebrated stock had then been introduced about twenty years. The spirit infused by that eminent breeder has, we believe, been unceasingly at work ever since. It is well known that the late Duke of Bedford once hired for the season a ram of the late Mr. Buckley, of Normanton, for the sum of 800 guineas; and also, that Messrs. Thorpe, Dudding Loft, and Marris, paid to the same gentleman 1000 guineas for the hire of a ram. The success of Mr. Burgess, of Holm-pierrepont, at the last Christmas show in London, will alone prove the high place he holds in the present day, not only as compared with his neighbors, but as challenging competition with the country at large. And although these names belong more properly to the other division of the county, their owners are honored, and have their merits recognized, alike in both.

Nearly every farmer in this western district is a breeder of sheep. The

country is more adapted to the support of that animal than to any other; and it is doubtful whether so certain a profit is attainable by any other method of stocking a farm as by the farmer *raising* his own flock. For the difference between the price of poor stock, and the same animals when made fat, has of late years been so small, as not unfrequently to leave little or no profit to the person in whose hands that change has been effected. On the other hand, the fault of those who breed lies too often in breeding more than they can well keep at all seasons, and thereby materially lessening their profits. We are convinced that any infringement of the above as a rule, will assuredly in adverse seasons be attended by greater loss than is ever made amends for, by the profits of more favorable years.

We have before observed that it is the general practice to sell the wether hogs fat before midsummer, when, without any great forcing, they will frequently attain a weight of from 20 to 22 lbs. a quarter, their fleeces averaging from 7 to 9 lbs. To bring about this result when allowance is made for the number kept on the acre, no time must be lost, and it can only be accomplished by giving them fruitful pasturage on clover seeds during the summer, and by putting them early to turnips in the autumn, with an allowance of linseed-cake or corn, mixed with culm or chaff, to meet the wants of the animal during that season especially when it is fed on the turnip, a food not natural to it, and for that reason requiring the assistance of some such auxiliary.

During the several years when there was an annual prize show at Blyth, (which is now discontinued,) the animals from this district exhibited there might have borne comparison with any others that could have been brought against them. The show took place in May, at the fair which is held during that month. The competition was between the exhibitors of the best pen of 20 wether hogs, clipped. The age of the sheep would then be about 15 months. The weights to which these animals attained were in some instances 35 lbs. a quarter, and even more. Amongst the most successful of those competitors was Mr. Allison, of Bilby, who has for many years distinguished himself as a breeder of pure Leicester sheep. We mention the above only to show what may be obtained by superior blood, with unremitting care and attention.

Southdowns are kept on some of the large estates, but they do not obtain a place amongst the general stock of the county. We greatly doubt, indeed, in opposition to all that has been said to the contrary by the advocates of Southdowns, whether they can compete with the Leicesters, age and weight considered. We made an experiment some years ago between the two, placing them as far as possible on an equal footing, and the result determined itself greatly in favor of the Leicesters. When fat lambs are wanted for an early market, the Southdowns possess an advantage, by being more hardy, more prolific, and nursing their lambs better than the Leicester ewes; but where the lambs are required to be wintered, and then go to an early market, they fail in both mutton and wool; their habits are more erratic, they want the quietude which the Leicesters posssess, and which contributes so much to their being made fat.

Before we quit this subject, we cannot but briefly advert to the greatly increased number of sheep now kept in this district, compared with the time when Mr. Lowe wrote. Many persons can remember, subsequently to that period, when forest farms of 300 acres of land had not more than 50 ewes upon them, and these of an inferior kind, and that much difficulty was often experienced in supporting them through the winter. These same farms in

the present day, as we can bear testimony, support from 500 to 700 sheep throughout the winter—the greater part of which are sent fat to market at weights of from 80 lbs. to 120 lbs. each.

We need scarcely observe that the breed of sheep known formerly as the one peculiar to this district, and called "The Forest Sheep," is now nearly extinct. Judging from the general appearance of the few which remain, they indicate an animal more likely to endure hardships than to repay any expenditure in attempting to improve it.

BEASTS.

As there is but very little permanent grass land in this district, the number of beasts kept is greater during the winter than the summer months. Many of the farmers sell off almost all they winter in the spring months, to the summer grazier, and buy in again to supply themselves in the following autumn. When the turnip crop is an abundant one, the number of fat cattle sent to market throughout the winter is very great. When that crop is less abundant, much fewer are made fat, the farmer's attention being directed chiefly to the converting of his straw into good manure, without drawing many turnips to be consumed in the yards. Any profit that he might realize on the feeding of cattle, he well knows would be more than counterbalanced by a diminished crop of barley, where such turnips ought to have been eaten on the ground. He accordingly contents himself with preparing beasts for the summer grazier by sending such stock to market in good condition, rather than by fattening them himself to the injury of his farm. This he does by giving to each beast a moderate allowance of linseed-cake, varying from 4 to 6 lbs., according to their size, other circumstances also being considered. The animal is thereby kept healthy, and with only a daily allowance of 4 lbs., which is the minimum of what ought to be given, will at least maintain its condition. Each beast will thus cost during the six winter months from three to four pounds, more or less, according to the price of cake at the time. When, however, the farmer has in prospect his next year's turnip crop, and looks still beyond to the barley crop which is to succeed, a proportion of his beasts will most probably be allowed 8 lbs., and such as are being made fat, from 12 to 16 lbs. each, which will impart a power and goodness to his manure, visible wherever it is applied for years afterwards.

The best farmers have long since ceased to give cake to their stock, at those times only when they find a profit on that stock to justify them in doing so. They now look upon the conversion of their straw into the best possible manure as an object of the highest importance to their farms. They calculate how they shall use the greatest amount of cake, which they regard as an indispensable in good farming, at the least possible loss; for, as prices both of beef and mutton have of late been, they must necessarily incur a loss if they expect their remuneration from the live stock, instead of from the land. The farmers take a wide view in this matter, and we think regard their interests in their true light. Mr. Pusey has observed, in his spirited description of Lincolnshire farming, that there the cattle are looked upon only as "machines whereby to make manure," and upon the same principle does the Notts farmer act when he considers his straw, which increases year by year with the improved condition of his farm, as a "vast number of tubes," whose use is to be filled with liquid manure, and carried out to the support of his future crops.

Beasts are bred to a greater or less extent on most farms, the only breed being, with few exceptions, the Durham, or as they come now to be styled,

"the Improved Short-Horns," of which the county can boast some of the best specimens in the kingdom. Earl Spencer's celebrated herd at Wiseton is too well known to require further notice here than to state, that we believe his Lordship continues to feel an undiminished interest in that department of farming. Mr. Parkinson's herd of Leyfields, near Newark, has also acquired a high character, to which it will be admitted to be fully entitled, by all who have seen it. Mr. Parkinson is owner of the celebrated bull, "Sir Thomas Fairfax," to which was awarded the first prize, as the best short-horn bull, by the Royal Agricultural Society in 1842. Mr. Watson, of Walkeringham, has in the course of a few years attained great eminence as a breeder of short-horn beasts, and is in possession of a bull, "Lord Adolphus Fairfax," of perhaps equal merit with his sire, "Sir Thomas Fairfax." These herds are well known amongst breeders, but the county has many others of less fame, though of distinguished merit, to which we only allude for the purpose of showing that their influence must have been very great on the general stock of the district. The most cursory observer has only to walk through any cattle fair in the county in the present day, to be struck with the improved appearance of the stock of all kinds, compared with what could have been seen a few years ago.

Calves are reared both by the pail, and by sucking the dam, or a foster-mother; but the point which appears to require most attention in the perfect rearing of any kind of stock, consists in promoting without any check a continued progression after weaning, without any loss of condition at that time, or indeed at any time afterwards. An instance of the effect of such a mode of treatment was given us some time ago by Mr. Brooke, in a large lot of bullocks, fed on the farm of the Hon. John Simpson, at Babworth, which averaged, when about two years and one month old, upwards of 60 stone each of 14 lbs to the stone.

PIGS.

Those who have pursued farming more as an amusement than from any profit to be derived from it, are observed generally to have evinced a greater disposition to improve the breed of pigs than of any other animal. It is especially the poor man's property, and this may account for the additional interest which has been taken in its improvement. Certainly no other animal has been subjected to so complete a metamorphosis during the last twenty years. Instead of the long-eared, coarse-offalled animal, which was common formerly, and which was as difficult to make fat as it was hard and unpalatable to eat when so made, may be now seen a compact creature, with small ears, short snout, deep in the sides and thighs, with legs short, and seemingly unequal to support the superincumbent weight which it is their office to carry.

It has been often said by various judges at the local agricultural shows in this county, that the show of pigs has been superior to any thing they have witnessed in any other part of the kingdom. And yet with such celebrity, we are quite at a loss by what term to describe the peculiarity of breed. One of the best breeds with which we are acquainted was supplied by the late Mr. Fowkes, of Barmborough Grange; it has been bred very closely, and without a single cross from any other source for more than thirty years. The breed to which we allude is that of Mr. Crofts, of Blyth, from which has emanated much of the best blood in the district. Viscount Galway has also a very superior breed of a similar caste, at his Lordship's seat at Serlby, which combines with great size the best quality, being quite equal in that respect to the Neapolitan or Chinese, yet in its general character bearing little affinity

to either; possessing a larger frame, attaining with nothing beyond ordinary keeping at 14 or 15 months old, 25 stone and upwards. This breed of pigs has the greatest possible aptitude to fatten, and is made fat at the least possible expense; a merit which the cottager has discovered and fully appreciates. In default of a better distinguishing title, it will be no misnomer to call it The Improved Nottinghamshire Pig.

HORSES.

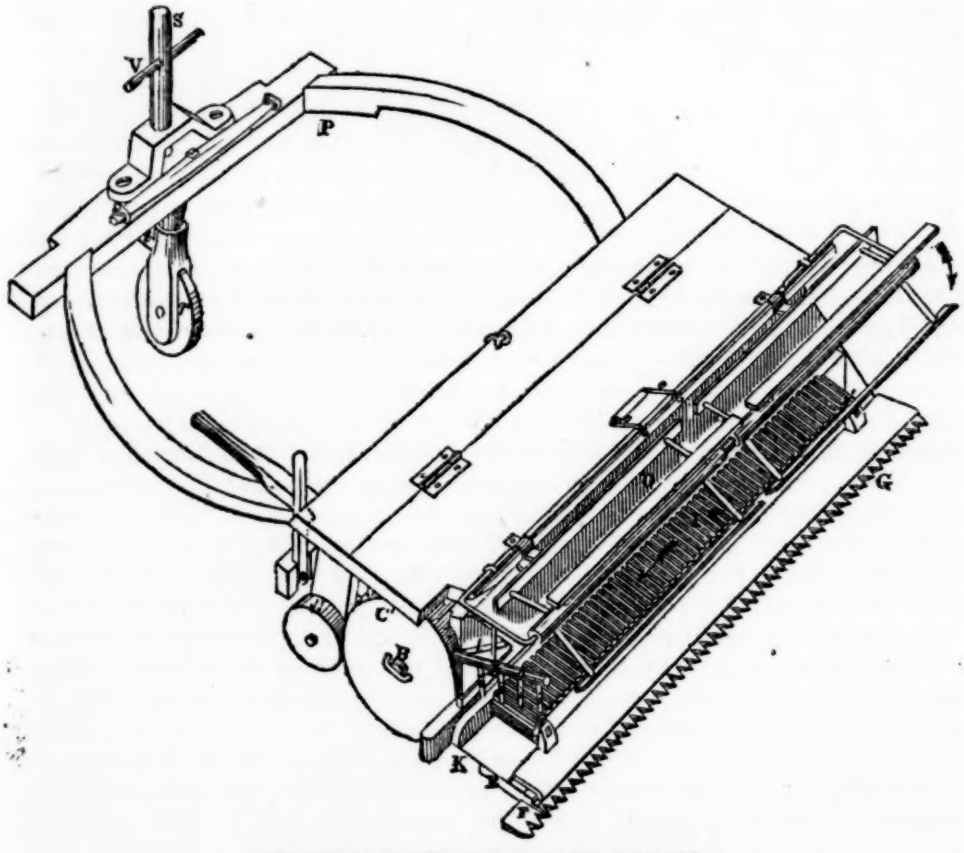
In this district the ploughing is invariably done by two horses abreast. The horses in general use are of a more active kind than formerly, being found to get over the ground much quicker than the old Lincolnshire breed, which in this part of the country is now nearly extinct. Many of the mares have of late years been crossed by a Cleveland stallion, brought into the county at a great expense by Mr. Watson, of Walkeringham, whose spirited exertions in behalf of agriculture in every branch are well known. This cross has unquestionably been an excellent one for the light soils, by imparting to the ploughing horses a mettle and speed which they before wanted. Many however of the farmers buy their horses as they require them, at two or three years old, of the graziers of the Trent side district, where the permanent grass land offers a more suitable pasturage than the sheep-walks of their own.

Premiums are given also for blood horses by the Agricultural Societies; but they do not receive much attention from the majority of farmers. With the late increased demand for good horses, both in the home market and on the continent, the prospect of remuneration in that department has been certainly equal to any other. The farmer looks, and not unwisely we presume, at the long period of five years, which must elapse before the animal is marketable, and also at a certain risk during that length of time, with perhaps an uncertain profit at the end of it. Any speculation which requires such a length of time to decide it, does not, we confess, present a very encouraging field to enter upon; nevertheless, if the first principle of breeding be looked to, which is that "like produces like," and we were to expect good ones only from good ones, we believe that the uncertainty would be much lessened.

The Yorkshire Wolds have been long regarded as the nursery for our best blood-horses, the breeding of which has there been considered lucrative, from its being confined to such horses only. The degree of success will depend much on the stallions introduced into the district being of first-rate character; but as these are a class which can only be had for high prices, and which it does not suit the generality of breeders to supply, they must be introduced, if at all, by the wealthy and influential.

(To be continued.)

To Secure the Fruiting of a Tree.—The following directions may, probably, be interesting to some experimentalists and amateur gardeners. They were given to me several years ago by the late Lady G. Murray:—Select a tree well furnished with blossom buds, just as they are beginning to expand. Take a potato-fork and with it make holes all over the surface of the space occupied by the roots, heaving the earth by pressing on the handle, and with this exertion make holes about 18 inches apart. Having dissolved 1 oz. of nitre to 3 gallons of water, fill the holes with the solution. No manure must be given. Should, after stoning, the tree appear unable to sustain the fruit, the following preparation may be applied in the same manner. To 1 gal. of blood add 1 gal. of water and 1 oz. of potash. Stir the whole well together, and when it has settled, pour off the liquid, and mix 1 gal. of this liquid with 1 gal. of water, and pour it into the holes made in the manner already described.—*M. E. H.*



START'S PATENT GRAIN REAPER.

The annexed engraving is a perspective view of a Grain Reaper, invented and patented by Mr. William H. Start, of Smyrna, Kent county, Delaware, in June, 1851. A A is a strong frame; it rests upon the axle B, of the running wheels C. The wheels are fixed to the axletree by a catch of each, inserted in a notch on the axle, near the end of each hub When the machine is drawn backwards, these catches have no effect on the notches, and both wheels turn independent of the axle. The front rail of the frame projects in front of the axle, to allow the cut grain to fall between the cutting apparatus and a fence D, in front of the running wheels. The cutting apparatus consists of two members, the lower one, F, being stationary, and secured to the bar E, while the upper one, G, is made to move to and fro over the roller. Each of these members consists of a toothed blade, which, as the machine advances into the standing grain, cuts it between the teeth. The motion of the cutting blade is given by a crank, with which it is connected by a rod. The crank is secured to a shaft at the front; the said shaft extends back and has a bevel pinion on its back end, gearing into a bevel wheel (not seen) on a short shaft parallel with the axis This short shaft gears by bevel gearing with the axle B; as the axle revolves, the crank is made to revolve also and give the cutters a reciprocating motion. I is an endless apron behind the cutters, which is made to revolve by a belt that passes over a pulley on its shaft, and a corresponding one on the crank shaft spoken of. By the motion thus imparted to it, the upper part of the apron is forced to move in the direction of the arrow, by which means the cut grain is conveyed to the side K, of the machine, and is heaped against a gate. The latter consists of a series of teeth, *i i*, secured to a head *k*; this gate is secured to a piece fastened to the front bar of the shafts F, and to the end of the fence D. In the end of the axle outside the wheel there are one or two pins, which, as the axle revolves, strike the hind end of the gate handle. This makes the bunches of cut

grain drop to the side clear of the machinery. In order to lay the cut grain evenly upon the endless apron, and to facilitate the action of the cutter, a reel revolves above the cutting apparatus. This reel can be raised or lowered, to suit the kind of grain to be cut. The machine is advanced forward by a team behind, hitched to the whiffletree within the shafts, P. The parallel whiffletree bar behind has a vertical standard, S, having a wheel, *r*, on its lower part; it has a steering tiller, *t*, (seen partly below,) by means of which the wheel is turned to change the direction of the machine. The upper part of the standard, S, has a cross bar, V, on it, by means of which, when the driver sits on the back bar, he can guide the wheel, *r*, as required. The wheels are made high, so as to give a decided advantage for ease; the grain is discharged in bunches, so that they can be bound with facility. Grass can be left in winrows by raising the gate.

FLAX COTTON AND M. CLAUSSEN'S INVENTION—PROSPECTIVE ADVANTAGES TO AMERICAN FARMERS.

It was, if our memory serves us, in the autumn of the year 1836, that a Captain Baylis, an agent of the East India Company, visited the neighborhood in which we then resided in Mississippi, with the view of engaging the services of a dozen or more of such of our best practical planters as could be induced, by the offer of liberal monthly wages and the contingency of a munificent reward in case of ultimate success, to accompany him to the East Indies and establish there large cotton plantations on the Mississippi plan. Under the direction of the persons so engaged, the Captain laid in large supplies of cotton-seed, gin-stands and agricultural implements. This was the commencement of an expensive but well-directed effort on the part of England to emancipate herself from a dependence on this country for her greatest manufacturing staple. Query: Had she succeeded, how long would cotton have been admitted into her ports duty free? But fortunately for us, the experiment, though made in every part of the East Indies holding forth the least prospect of success, failed—failed so signally that it will never be renewed. Still struggling to free herself, England now grasps at this discovery of the Chevalier Claussen, and fancies the elements of emancipation now within her reach: but in our opinion she is again doomed to disappointment; the multitude will never be clothed in linen fine or coarse, nor in a sanitary point of view is it desirable. The monopoly of cotton will ever remain in our hands, as Providence designed it should, a curb stronger than steel upon British Rapacity. The possibility of working up flax on cotton machinery is now *the* question with the agricultural and manufacturing world, and we will endeavor to keep our readers posted on the subject. The following letter from Mr. Bateman takes a more comprehensive view of the subject than any we have yet seen. We had almost forgotten, in connection with this subject, to return our thanks to Mr. Allan Cameron, of New-York, for some really very fair samples of flax cloth, spun and woven on cotton machinery; together with a work published by Mr. Wiley on the cultivation of flax, the pith of which we will publish on some future occasion.

London, June 18, 1851.

Friend Harris:—Among the first subjects I had noted down as demanding particular investigation during my visit here, is the one named at the head of this letter; and hence as soon as I had completed a general view of the Crystal Palace and its contents, I sought after the Chevalier Claussen and his very interesting display of articles illustrating his invention. I found him surrounded with specimens of flax and flax cotton, in all stages of its preparation and manufacture, and himself very free to communicate the fullest information I could desire on the subject; and as I am inclined to believe this information

will be found of much practical value to the farmers of Ohio, and our Western country generally, I will devote this letter to *flax cotton*, instead of the World's Fair in general.

In the *Ohio Cultivator* of May 15th may be found a partial description of M. Claussen's invention, for which he has obtained letters patent in most countries of Europe, and in the United States. He has recently disposed of the right for the United States, to a couple of gentlemen of this city, one of them an American, who inform me that they are now effecting arrangements for the speedy introduction of its use in our country, and they are determined to prevent any monopoly of its advantages by speculators, by granting rights on moderate terms to persons or companies in numerous different places. Particulars, as soon as determined, will be announced in the *Cultivator* and other papers.

In the mean time I would suggest to such farmers as are now growing flax for the seed, that it may be well for them to save the straw in a dry and secure place, after the seed is threshed out, as it will in all probability be worth from $5 to $8 per ton, or more, as soon as the simple machinery can be introduced which is required for reducing the fibre from the dry straw to a suitable condition for market, which we are assured shall be introduced during the coming autumn or winter.

This machinery is only a series of iron rollers, propelled by horse or other power like a threshing machine, which crush and break up the woody portion of the straw, so that by shaking or scutching, it can be mostly separated from the fibre; although by this dry process the fibre is left in a coarse and half cleaned state. It is now ready to undergo the chemical process and manipulations described in M. Claussen's pamphlet, and is also in a fit state for putting in bales like cotton or hemp, for market, and is worth from $50 to $60, or more, per ton, as prices now range, to persons who may engage in the business of completing the process and shipping the cotton to the manufacturers.

The value of this material to the manufacturer will of course vary slightly according to the price of cotton, and may be supposed to bring about the same price, in its finished state, as fair qualities of cotton, say from 10 to 12½ cents per pound in New-York, or from 12½ to 14 cents in England.

In estimating the cost of producing flax cotton in England, M. Claussen puts the value of the flax straw at $20 per ton; or of the rough fibre as cleaned by the grower at about $60 per ton; then the cost of materials and labor for completing the process, at about $25 per ton of rough, or $50 per ton of finished fibre; making the total cost to the manufacturer about $175 per ton—which he is sure is a liberal estimate; and this is only about one half the ruling price of cotton for the past year.

In regard to the value of the flax cotton for manufacturing purposes, all the experiments that have as yet been tried seemed decidedly in its favor, whether used alone or mixed with cotton or with wool. I have examined fabrics of each class, and can testify that their appearance is good and their strength quite remarkable. I will inclose in this letter a small sample of the flax cotton, and also of unbleached muslin made from flax and other cotton mixed in equal proportions, for the inspection of any readers of the *Cultivator* who may be curious to see them.

To show that experienced manufacturers have full confidence in the success of this new article, it may be stated that several large establishments are prepared to engage in the business as soon as the new crop can afford a supply of the material. Among these are the mills of Messrs. Quitzow, Schlessinger

& Co., near Bradford, and Mr. Dagan, near Cork, in Ireland; also of Messrs. Bright Brothers & Co., Rochdale, England.

Samples of the cloth woven at the mill of Messrs. Bright Brothers, of Rochdale, were exhibted at the meeting of the Royal Agricultural Society, on the 26th of February, as well as of the following articles, as noticed in the official report of the proceedings:—

Sample of flax straw, prepared according to the new process, adapted for linen manufactures.

Sample of long fibre scutched from the above.

Samples of pure flax fibre, or "British cotton," adapted for spinning on cotton machinery.

Samples of yarn spun on cotton machinery, some from all above flax fibre, others mixed in various proportions with American cotton, those mixtures being termed by the inventor flax cotton.

Samples of flax fibre prepared for mixing with wool.

Samples of yarn produced on ordinary woollen machinery, composed of wool and flax in various proportions, termed by the inventor flax wool.

Samples of flannel woven from the above.

Samples of fine cloth woven from yarn composed of flax and wool in various proportions, and dyed.

Flax fibre prepared for mixing with silk, and dyed of various colors.

Flax fibre mixed with spun silk, and termed by the inventor flax silk.

A sample of yarn produced from the above.

Samples of flax-cotton yarn dyed of various colors.

Samples of cloth woven from flax-cotton yarn and wool, dyed.

After a full and careful investigation of the whole subject, the Royal Agricultural Society give the following conclusions in their official report, in regard to the advantages of this method of preparing flax:

That by the new process flax is rendered capable of being spun, either in whole or in part, on any existing spinning machinery.

That the fibre to be mixed with cotton or spun alone on cotton machinery, is so completely assimilated in its character to that of cotton, that it is capable of receiving the same rich opaque color that characterizes all dyed cotton; and, consequently, any cloth made from flax-cotton yarn can be readily printed, dyed, or bleached, by the ordinary cotton processes.

That the flax fibre can always be produced with profit to the British grower at a less price than cotton can be imported into this country with profit to the foreign producer.

That, as a consequence of this advantage, the manufacturers of this country will be less dependent on the fluctuations of the cotton crop for a supply of the raw material, and a more regular employment will be given to the manufacturing population, and the present amount of local rates be greatly diminished thereby.

That the British grower will of necessity derive great benefit from the supply of the wide demand thus opened to him.

That with respect to the advantages of being able to spin flax in combination with wool on the existing woollen machinery, the first is, that the flax prepared by M. Claussen is capable of being "scribbled," "spun," "woven," and "milled," in all respects as if it were entirely wool; having an advantage in this respect over cotton, which has not the slightest milling properties; on the contrary, the flax fibre is capable of being even made into common felt hats with or without an admixture of wool. To such an extent has the milling property of flax been proved, that the sample of cloth exhibited had been woven to 54 inches wide, and milled up to 28 inches wide.

That the flax fibre will not, under any circumstances, when prepared for spinning with wool, cost more than from 6*d.* to 8*d.* per lb., while the wool with which it may be mixed will cost from 2*s.* to 4*s.* per lb.; consequently reducing the price of cloth produced from this mixture 25 or 30 per cent. below the present prices of cloth made wholly from wool, and being of equal, if not greater durability.

That short wool refuse, which cannot by itself be spun into a thread, may, by being mixed with this thread, be readily spun and manufactured into serviceable cloths.

That by this process flax may be also so prepared as to be spun in any certain proportions with silk upon the existing silk machinery; that when so spun, it is capable of receiving considerable brilliancy of tint. That the fibre may be prepared for thus spinning

at a uniform price of from 6*d.* to 8*d.* per lb. That as it may be spun in any proportion with silk, it is evident that the price of the yarns must be reduced according to the relative proportions of the materials employed, thus extending the markets, and giving increased employment to the operatives.

That, by M. Claussen's plan of bleaching, any useless flax can be converted into a first-rate article for the paper maker, at a less price than the paper maker is now paying for white rags; and suitable for the manufacture of first class papers.

[We hope this last suggestion will be borne in mind by our paper makers at Delaware and elsewhere, and be the means of effecting some improvement in the durability and strength of our printing paper.]

The unlimited demand for the material is another strong reason in favor of this new discovery. The quantity of cotton required for the English manufacturers alone is stated at 777,000,000 lbs. per annum—or *a thousand tons per day!* Of flax, the amount now used annually in Great Britain is about 100,000 tons, not more than one fourth of which is of home produce. For the past two years it is stated that the supply of cotton produced in the world has not near equalled the demand, and it is believed that the growth of this article in the United States has reached its maximum; hence the manufacturers of England are casting about to discover some new material, or new source of supply, and even if the flax cotton should form but a small relative proportion of that supply, it is easy to see that the demand would at once become so great that no farmers need ever to apprehend a glutting of the market. Nor will it be possible for a supply of flax to be produced by the farmers of Great Britain or the adjoining countries of Europe, without serious detriment to their agricultural interests. It is obvious, therefore, to our mind at least, that this discovery will soon lead to very important results to the farmers of the United States.

THE TENDENCY OF THE TARIFF OF 1846.

We take the following from a speech recently delivered at Reading, Pa., in defense of our present commercial policy; and we do so because we feel satisfied that it depicts clearly the result towards which we are now most rapidly tending, and because we desire to ask our agricultural friends to reflect how it is that they are to be benefited by converting all the present makers of iron and cloth, and all the present miners of coal and ore, into producers of food, instead of remaining as they are, consumers of food—rivals instead of customers? The annual growth of population is now more than 800,000, and a large portion of these would, if permitted, employ themselves in building furnaces and mills, and opening mines, and in making cloth and iron, while consuming food; but if driven to it, they must become producers of food. We pray our farmers to look at the present price of wheat, and to reflect what is likely to be the price when the events here predicted shall have occurred, as they must occur if our present policy be continued. The speaker said, that

"The keen and far-seeing statesman of the South understood and comprehended the science and true policy of this Government much better than the Northern speculators and capitalists, and consequently fought the question of protection most manfully for upwards of twenty years; that the *heart* of the Democratic party in the free States always had and always would beat in unison with the Democratic free trade of the South, of which the lamented Calhoun was the head and front; that the greatest difficulty in the Democratic party of the free States consisted in the fact, that a portion of the party (the laboring men) inclined strongly towards the protective system, which had

heretofore prevented the party from incorporating the system of free trade as a cardinal principle of their faith, and which was neither more nor less than the total abolition of the custom houses and the revenue officers, and a resort to direct taxation for Government expenses, and to that it would and must sooner or later come; *and if by it all the iron works, coal mines, and factories would be closed up and abandoned, and the laborers thrown out of that kind of employment, still the country would be benefited by it, and it would enable the foreign manufacturers, with their cheap labor and superior skill, to furnish the consumers with the article at low prices, and thereby prevent the acquisition of wealth and the consequent growth of home aristocracy*—in other words, it would equalize the people in point of property to a greater degree than under the operation of the protective policy; in fact, it would make and keep the people more *democratic*."

It *would* certainly equalize them, not only among themselves, but with the world, for the farmers and artisans of this country would become as poor as those of Europe.

For the Plough, the Loom, and the Anvil.

THE PICKMAN FARM, SALEM, MASSACHUSETTS.

Messrs. Editors:—I know not how I can, at the present moment, better respond to your request, to furnish facts of a practical character, useful to the farmer, than by stating some of the impressions derived from a recent visit to Mr. Horace Ware, jr., the tenant of the Pickman farm, in Salem.

This farm—situate on the south-westerly borders of the city, adjoining Marblehead and Lynn—contains upwards of four hundred acres. It borders on Forest river, from the marshes of which much of the best mowing land on the farm has been reclaimed. About half of the whole is rough pasture, of which no use has been made, except to feed the numerous stock of cows kept on the farm—generally from thirty to fifty: at the present time Mr. Ware said he had thirty-four. In answer to an inquiry as to their produce, I was surprised to hear him say, *one gallon* per day for each cow through the year. I should have guessed that good cows, running in good pastures like these, under good management like Mr. Ware's, would have yielded much more than this; but I remember to have learned, twenty years since, on a visit to the farm of Mr. J. Nichols, of Salem, then one of the best managed milk farms in the vicinity, that the average produce of the cows was five quarts, or one and a quarter gallons, per day for each cow, through the year. I have seen it stated recently, that on a celebrated milk farm in the vicinity of Boston, the average produce to each cow per day was eight quarts, or two gallons. I think this must have been for the season of milking, and not through the year. I cannot understand why the amount should be so much greater at Boston than at Salem, unless their famous water-works help the quantity.

This leads me to speak of the supply of water on the Pickman farm. It is obtained by means of an *hydraulic ram*, from a small pond, situate in the pastures, at a distance of half a mile or more from the buildings. This pond is about twenty feet above tide-water. A fall of fifteen feet is used for the purpose of forcing the water. The click of this machinery has been constant for the last two years, requiring no superintending care whatever. The water is conveyed through pipes, across the channel of Forest river, and distributed at such points on the farm and about the buildings as most needed. I noticed in the cow-yard a long trough, filled with clear water, at one end of which

bubbles were constantly rising on the surface. I learned this was where the supply came in, through the aperture of a *pipe-stem* of smallest dimensions; and in this way there was a sufficiency for the supply of the entire stock of cattle. I could not but admire the simplicity, the neatness, and the convenience of this arrangement. When I called to mind how many hours I had labored when a boy, to pump water for a stock of a dozen cows, and convey it, by means of temporarily-placed conductors, to the cow-yard, I could not but think that the daily saving in this item of labor would go far towards balancing all the outlay of expenditure. Then the purity of the water, and the constancy of the supply, are considerations of great importance. To the mingling of the water with the milk after it is taken from the cow, as is *sometimes* done, there are decided objections, which do not apply to a full supply before it is taken. On the contrary, I have ever considered a full supply of pure water to milch cows, just when they want it, one of the most important things to be regarded in taking care of cows. I have always found the best products of the dairy to be obtained from cows that feed in pastures fully supplied with pure water. Spring or running brook is preferable to pond water. That which is best for man to drink is best for cows also, provided it is not too cold. And it may be doubted whether the health of men is benefited by the reduction of temperature or the *addition of stimulants.* Nature understands very well what she is about in her order of arrangements. I learned from Mr. Ware, that the entire expense of material and preparations, for thus bringing the water 2,500 feet, was $225. It is now conveyed through leaden pipes. I should prefer block tin, which can be had at about the same cost; as I have no fancy for lead on the stomach, either *cold* or *hot*, or in any other manner; and am by no means satisfied that it is any better adapted to the stomachs of the cows. At all events, if the water is once impregnated with lead, I am not quite sure it will be entirely purified by passing through the cow's *laboratory* in being converted into milk. This is a consideration I leave to be determined by scientific gentlemen; I make no pretension beyond practical observation. This supply of water for all the purposes of the farm, struck me as one of the most simple, economical, and useful applications of scientific principles to ordinary purposes, that I have ever witnessed. It does on a small scale, what the power of the Schuylkill does on a large scale for the comfort and convenience of the city of Philadelphia.

From the same pond Mr. Ware obtains annually two hundred tons of ice, which he uses for the purposes of the farm; to wit, the keeping of the milk and products of the dairy in best condition. To my astonishment Mr. W. said he could cut and house the ice on the margin of the pond, at an expense not exceeding *six cents per ton;* and it could be taken home as they had occasion to use it. Here, then, from a little pond of one quarter of an acre, in an obscure pasture, surrounded by hills and hedges as rough as can be imagined, is drawn an inexhaustible supply of *pure water* and *cooling ice*, for a dozen men and sixty cattle through the year, at a cost not exceeding *thirty dollars.* This is a luxury that any common farmer, even on a small farm, could command, who has a spring or pond near his premises; for from a spring a pond could be filled. Did our farmers know the comforts at their command, so many of them would not drudge on from year to year in the paths their fathers trod before them, without any effort at improvement; but they would arouse from their lethargy and embrace their privileges.

This Pickman farm has been distinguished for the products of the orchards upon it; but Mr. Ware stated that these products have fallen off very much for the last half dozen years. There has been no want of care in "digging

round and dunging" the trees, and their growth and appearance are luxuriant but still the fruit is not forthcoming, or comparatively speaking, nothing to what it used to be. Here is another field for the speculation of gentlemen of science. The understanding has been, that when trees are well taken care of, the laborer will be rewarded for his toil; but the rule is not universal, no man being more thorough and persevering in what he undertakes to do than Mr. Ware. Possibly that element in the soil which feeds the growth of fruit has been exhausted by an over product, and something should be applied to replenish it. What that *something* is, is the question. Heretofore more than one thousand barrels of the first quality of apples have been gathered in a single year, on this farm; now it would be difficult to find *one hundred* barrels, although this is the bearing year for the Pickman apple, which has long been celebrated. In my glance at the premises, I have felt it to be a duty to speak of things as they are, whether for or against, as presented to observation.

Mr. Ware is now engaged in reclaiming about sixteen acres of wet meadow land, for which he is to have when complete fifty dollars an acre for his labor. He thinks the land will then be worth two hundred dollars an acre. It is situate alongside of the Eastern Railroad, for the space of a quarter of a mile, by which manure can be taken from the city of Boston, at an expense of three dollars per cord. Mr. Ware has had much experience in reclaiming wet meadow lands on his own and his father's farm in Marblehead, an account of which it was my intention to give when I took my pen in hand, but I find my paper filled.

One thing should not be omitted in relation to the Pickman farm. It has been under the *care of tenants* for *fifty years* or more, and has constantly grown better. This is so different from the ordinary operations of tenancies, that it should be marked to the credit of the owner and the occupant. None but judicious owners and faithful laborers could bring about such a state of things.

It was my privilege to make the acquaintance of the late Col. Skinner, the senior Editor of the *Plough, Loom, and Anvil*, on his last visit to New-England, in September, 1850. By his politeness, I have since been favored with the perusal of his journal, by which I have been much instructed. I was deeply grieved by his sudden departure from life, at a time when the public were expecting many years more of useful labor. Science lost in him an ardent friend; agriculture lost a devoted admirer. Few men have done more to advance the best interests of the *industrial classes* of our country than he. At all times, early and late, he was content to labor for their good, regardless of self. While others were striving to benefit themselves, he was best pleased when he most benefited his country. I shall never forget the point and power of his remarks, at a meeting of the farmers of Essex, when I had the honor to introduce him at their annual Festival. Little did I think, then, that I should see his face or hear his voice no more for ever. But although he so soon departed, his words and works remain a monument to his industry, more valuable than gold, more durable than marble.

With great regard, I am your obedient servant,

J. W. Proctor.

Danvers, Mass., September 8, 1851.

A Thriving Animal.—Mr. A. A. Knowles, of North New-Portland, says that a calf belonging to him, which weighed one hundred and twenty-six pounds at the age of four days, weighed in four weeks from that time two hundred and thirty pounds, being a gain of one hundred and four pounds in just four weeks.

EFFECT OF BRINGING THE CONSUMER TO THE SIDE OF THE PRODUCER.

We republish the following account of a Vermont farm, because desirous to show to some of our Southern and Western friends how it is that Northern men grow rich, and why it is that so many of themselves remain poor. The great secret is to be found in the fact that the Northern man can almost always, when he will, return to the land as much as he takes out of it, while both the planters of the South and the farmers of the West are perpetually engaged in extracting from their lands all the soil capable of affording nourishment to vegetation, and sending it abroad to be wasted in distant markets, and expending half the labor of themselves and their horses in the work of carrying it there. The Northern man makes a market on the land for potatoes and turnips, milk and fresh meat; and he can afford to cultivate those things of which the earth yields by tons, because transportation is not needed, and the more he takes out of the land, the more he can return to it. The Southern man, on the contrary, raises a commodity of which the earth yields by pounds; and he exhausts his land, because of the little he takes out he returns nothing whatever back to it. Always taking out of the meal-bag, and never putting any thing back, it is not a matter of surprise that he finds the bottom, and has then to run away himself:—

Mr. Bradley's farm is situated on the southern bank of Onion river, about two miles from its confluence with Lake Champlain, and about the same distance from Burlington Village. It contains four hundred acres, more than half of which is rich intervale land, whose crop of grass never fails, and the remainder is upland, once covered with majestic pines, stately maples, birch, and other hardwood growth. The river forms a gentle curve, and makes more than half the fence necessary to inclose the farm. The prospect from the farm-house over the rich intervale is truly romantic and picturesque, and makes one love the country. Soon as you rise from the intervale, you stand on a rich, highly-cultivated soil, with a twenty-acre field of wheat before you, whose heads reach above the top of the fence, and thick as they can stand. This is spring wheat, and the finest growth I have ever seen. No fields in the fertile West beat it. Standing erect, tall, even, heavily headed and thick, it makes one feel the comfort and glory of farming. On these twenty acres there will be harvested, at the least calculation, five hundred bushels of good, plump wheat, a crop that will fill many hungry stomachs, and give the cultivator a very handsome profit for his toil and labor.

Near by stands one field of corn containing fourteen acres. This is rank and luxuriant, promising a heavy yield. A portion of this field was manured by muck taken from low ground close at hand, and without previous preparation put upon the land. The corn on this part thus manured is even stouter than that enriched by barnyard dressing. The soil is light, loamy, and well calculated for the growth of such a crop, especially in seasons so wet and cold as this has been. Close beside the county road which runs through this farm I saw twenty-six young, handsome, sleek cows, in a field of clover up to their eyes. I verily thought the animals had broken into a hay-field, so tall, fresh, and green was the clover, and suggested to the owner the propriety of driving them out, but he assured me with a smile that the creatures were rightfully there. It was new ground, and the grass very rank and stout. I did not suppose any good, economical farmer would turn his cows into a clover field like that, but he told me they "hayed it" on the intervale until they got fairly sick of it, and let the cows and other animals eat the grass on the uplands. Considering the number of acres, this is unquestionably one of the best farms

in this or any other State of our Union. The potato crop, as well as the others, promises an abundant harvest. The intervale, with the river winding round it upon the eastern and northern side, and its few stable elms left for shade, is a perfect picture, such as the painter would love to sketch.

There will be a heavy crop of wheat in Vermont, considering the amount sown. Neither rust nor the weevil has troubled it this season; and we may fairly conclude that next season much more will be sown. The people on the west side of the Green Mountains can raise their own flour as well as other crops, and now that the destructive insects have ceased their operations, it is reasonable to expect that growing wheat will be more generally attended to than it has been in years past. Winter wheat will now be sown, and abundant crops may be expected. All crops in this region will be good this season, with the exception, perhaps, of corn, and that looks fine in many places. Who would not be a farmer? Old Vermont can feed her own sons with flour, as well as clothe others with the wool of her sheep.

WHO PAYS THE DUTY?

Five years since, the Secretary of the Treasury, Mr. Walker, made a report to the Senate, in which he showed clearly that the price of coal to the consumer was greater by the whole amount of the duty, $1 60 per ton, than it would be if there were no duty, although the actual selling price of coal at Pittsburg, Pottsville, Wilkesbarre, Mauch Chunk, and the other places of production, did not average even a dollar and a half. In this way he demonstrated that a tax was imposed upon the people of the Union to the extent of six or eight millions of dollars, and that thus the consumption of this most important commodity was greatly lessened. With a view to increase consumption of domestic and foreign coal, and encourage navigation, the duty was reduced to about fifty cents per ton, and by the same law *the consumers of coal*—the manufacturers of cotton and woollen goods, and the producers of iron—*were deprived of protection*, the consequence of which is seen in the closing of mills and furnaces throughout the Union. How far this has served to aid foreign commerce, may be seen by the following, to which we invite the careful attention of our readers:—

Our Trade With Nova Scotia.—The *Pictou Chronicle* says: "We have received from the American Consul at this port, the following statement of arrivals of American vessels for the six months ending 30th July, in the years 1849, 1850, and 1851, by which it will be perceived that there is a great falling off in the trade carried on in American vessels:—

	1849. No. of Vessels.	1850. No. of Vessels.	1851. No. of Vessels.
May,	14	4	1
June,	21	19	4
July,	54	25	9
Total,	89	48	14

"The quantity of coal shipped to the United States is much less this year, up to July 5th, than for many years previous. We give the following comparative statement with last year:—

1850,	American vessels,	3,186	chaldrons.
1851,	do. do.	672	do.
1850,	British vessels,	12,585	do.
1851,	do. do.	6,654	do.

"This great disparity in the demand for our great staple is to be attributed

to many causes, but more particularly to the opening of valuable coal mines in the United States, and the heavy duty imposed on the coal from Nova Scotia."

Re-establish the tariff of 1842, and the trade with Nova Scotia will at once increase, because the power to consume coal will at once be doubled. In the fiscal year 1842-3, we imported but 55,000 tons, whereas in that of 1845-6 we imported 156,000, upon which the producer paid a duty of $1 60 per ton; whereas from present appearances we will this year import less than fifty thousand tons, at a duty of about fifty cents, and yet "the heavy duty" is, we are here informed, the cause of the diminution.

AMERICAN POMOLOGICAL CONGRESS.

Below we publish the proceedings of the Congress held in Cincinnati, October 2d, 3d and 4th, 1850—as a guide only to such of our readers as may be located between the Ohio and the Lakes. We are every day finding out that a few degrees of latitude or longitude make a great difference in the quality of the same variety of fruit; thus some of the favorite varieties of New-England apples and pears are reported as inferior by this Congress:—

Dr. W. D. Brinckle, of Philadelphia, was chosen President; F. R. Elliott, Ohio, P. Barry, N. Y., and I. A. Warder, Ohio, were chosen Secretaries. A motion was made and carried, that a committee be appointed to report upon the expediency of establishing American Pomological and Botanical Gardens. After deliberation, the committee reported as follows:

"That it is expedient to enter upon the enterprise suggested in the resolutions, and to carry it out. The spirit of the age favors the project, and this project needs only a Northern, a Southern, an Eastern and a Western establishment of the kind, to become one of the most important and most useful bodies of promoters of the pleasure and profit of mankind. The committee beg leave to be allowed time till the next meeting of the Congress to report further."

Dr. J. A. Kennicot, of Illinois, desired to introduce the subject of the culture of the grape and the apple, as connected, in the manufacture of wine and cider, with the cause of temperance. The remarks were to the effect that he considered the cause of temperance advanced by the introduction of native wines at a cheap rate—that they may take the place of distilled liquors.

List of Pears Rejected.

Spanish Bon Crieton, True Gold of Summer, Hessel Summer Rose, Petit Muscat, Roussellet of Rheims, Princess of Orange, Ah! Mon Dieu, Bleecker's Meadow, Huguenot, Michaux, Beurre Knox, Franc Real d'Hiver, Clinton.

The "Belle of Brussels" was proposed to be placed on the rejected list, but several gentlemen seeming inclined to give it further trial, it was not entered then.

List of Pears that promise well.

Paradise d'Automne, Stevens Genesee, Onondaga or Swan's Oranges, Doyenne Gabault, Nouveau Poiteau.

List of Apples rejected.

Egg Top, Cheeseboro' Russet.

List of Apples that promise well.

Northern Spy, Melon, Mother, Hawley.

The Stevens Genesee Pear was regarded by many of the Congress as wor-

thy general cultivation, but there being one or two objections made, it was put on the list as promising well.

Mr. Saul then introduced the Belmont or Gate Apple for remarks. Mr. Wood spoke in favor of it; so, also, Mr. McIntosh.

Mr. Saul spoke of the following apples as promising well, and worthy of culture, viz.: Eustis or Ben Apple, Monmouth Pippin, Peach Pond Sweet, and Sturner Pippin.

A resolution was passed, "That when this Congress adjourn, we do so to meet in the city of Philadelphia, on such a day in the month of September, 1852, as shall be hereafter designated by the President of this Congress."

For the Plough, the Loom, and the Anvil.

SCRAPINGS OF THE BARN-YARD FOR WHEAT, &c.

Could negligent farmers appreciate the intrinsic value of the dust of barn-yards and lanes—could they know the effect that it produces, and know that a single load, judiciously applied, is worth dollars, they could not but exercise some of their muscular strength towards accumulating and applying it. The plain truth is, many farmers do not put that value to the scrapings of farm-yards which they are entitled to, and hence the loss of so much valuable fertilizing matter. In fact, there is a certain class of agriculturists who have no more reason about them than to get angry even if you talk to them about scraping and digging out the nooks and corners of their yards with a hoe. Such farmers most invariably adopt the skimming system—that is, take the mulch and leave the most valuable manure their yards afford. Examine their yards, after they have "finished," and you find the very strata that are most essential to promote the productiveness of soil. The accumulation of these strata of manure is attributable, doubtless, to a sluggish propensity relative to the real worth of the substance. Most certainly, if two hands, with wagon and horses, can collect and scatter five loads of the dust in a day, it cannot be considered otherwise than a profitable business; for, from observation and trial, I verily believe that each load would produce three bushels of wheat—that is, when strewed on ground of a sandy and light nature. Then, allowing that such is the fact, no one can urge a reason for not getting out every pound of manure to be found within the precincts of yards and lanes.

To speak practically in reference to the application of the scrapings—the best way, perhaps, is to arrange the bottom boards of your wagon in such a way that shovelling will "go off" easily, and then strew the manure—the dust—as far each side of the vehicle as possible without causing an extra amount of labor. It should be spread evenly and nicely over the surface of the ground, as a matter of course, so that the wheat will not come up in "bunches," as it does many times, when the dust is thrown on inadvertently. I have frequently seen it used heedlessly, and the consequence was that the wheat looked spotted and disagreeable.

Relative to the effect of the scrapings of barn-yards on sandy loam, oak and chestnut soils, &c., it must be allowed at once that it is astonishing. Even if the manure is put on low, damp land, it will generally produce an effect almost incredible in its nature. It must be known by all who have tried even the coarse kinds of manure, that they prevent heaving, and when this is once prevented, there is no obstacle in the way to hinder success—that

is, as a general thing. We have tried this kind of manure so often, and with so much success, that we do not allow a load to remain in the yards undrawn. Though digging with the hoe is back-aching work, yet, notwithstanding, the process pays well, but does not always suit the "hired hands," for the most of them are not in the habit of scraping till nothing but hard-pan remains to be seen in the yard. W. TAPPEN.

Baldwinsville, N. Y., Sept., 1851.

THE MANUFACTURE OF PINS AND OF HOOKS AND EYES.

A correspondent of the New-York *Evening Post*, speaking of the manufactories of Waterbury, Connecticut, and the enterprise and prosperity of that town, thus describes two of its establishments:—

"And first of the American Pin Company. This is the largest pin manufactory in the United States, and I believe in the world. It has but one competitor in this country, and that is at Birmingham, in this State. The patent to which this company owes its success is a profound secret, not known even to its stockholders. It is never shown, therefore, to strangers. It consists in an improvement for the making the pin and head solid, and all from one piece of wire. Till within a few years the head of most of the pins in use was separate, and twisted on to the pin by machinery. A few solid pins were manufactured in England, but they cost from thirty to fifty per cent. more than those of the older fashion. The discovery of the American patent has driven the twist heads entirely out of use. The privilege of using it was sold in England for $30,000, where the same kind of pin is now manufactured.

"Of the portion of the works which I was permitted to see, I was most struck by the process of sticking the pins upon papers. My intellect had striven in vain to conjecture any process by which machinery could bring order out of the unspeakable confusion of several millions of pins thrown into a box together. I was here shown a row of very simple machines, each tended by a young girl, which arranged on papers more pins in a day than any one person could have possibly done by hand in a fortnight. A practised person, I was told, would pick 1,200 papers a day, each paper containing 280 pins, making in all 336,000 a day. In a day of ten hours this company throw off on an average 4,000,000 pins per day, or about twelve hundred millions a year. When I learned this extraordinary fecundity of a single pin mill, I felt that it was of but little consequence what became of all the pins; for it is pretty certain that the supply is not likely to give out very soon, in spite of any conceivable extravagance of pin money. The capital of this company is only $100,000, but its profits are reputed to be very great.

"Upon the same premises we were shown the works of the Waterbury Hook and Eye Company, where a capital of $16,000 is employed in the manufacture of hooks and eyes. Here were arranged long rows of little machines about the size of small washstands, under which a constant shower of these little feminine conveniences was pouring down, but from what cause or by what agency it was difficult to conjecture. Upon a closer inspection, a large spool of wire was perceived revolving slowly in its rear, growing shorter inch by inch in mechanical harmony with the machinery, while iron fingers, curiously articulated, were ready to grasp the severed fragment and pass it along from change to change, until it finally dropped into the receptacle beneath, a perfect hook or eye, ready for use. For a moment it seemed as if

each machine was instinct with life and intelligence. The power of speech appeared to be all that was lacking to complete the delusion. There were but four or five men in the apartment, who passed around occasionally from one stand to the other, to oil the machinery, to supply new wire when the previous spool was consumed, or to empty the vessels when filled by the silvery shower. The whole performance more resembled a voluntary process of nature than the result of a mechanical art. The duty of the superintendent of one of these machines seemed to me curiously alike to that of the gardener who plants his peach-stones, which, after many days, sprout, grow into a tree, blossom, and finally bear peaches, which, when ripe, drop from their branches and are gathered for use."

AMERICAN PRODUCE IN LIVERPOOL.

THE following extract from a letter of Mr. Bateman, in the *Ohio Cultivator*, besides abounding in valuable hints to the American producer, will enable him to estimate his chances of successful competition with the grain-growers of the continent of Europe:—

The state of the American produce market was one of the first objects of my inquiry. I was present at the great corn and flour exchange recently, where an immense amount of business was transacted in two or three hours. The sales are all made by means of small samples, displayed on counters or tables. I was much surprised to find a large portion of the flour and wheat, and even considerable Indian corn, was from parts of France, Holland, Russia, Egypt, &c., and but little, comparatively, (except corn,) from the United States. The quality of the wheat and flour, from France especially, was superior to much of that from our own country; and the low price at which it can be exported and sold, speaks well for the productiveness of that country.

During the month of April, 1851, the quantity of wheat imported into Liverpool from the continent and the Mediterranean, was 217,416 bushels; of flour, 27,328 sacks, (of 280 lbs.;) and of Indian corn, 61,414 bushels. From the United States, during the same month, there was imported 35,250 bushels of wheat, 15,911 barrels flour, and 38,060 bushels corn. The month of May, we were told, would show still more unfavorably for the American trade, and some of the flour recently arrived was sold at a loss of about $1 per barrel, (Ohio.) The price of good Ohio flour in Liverpool for some time past has been only about $5 per barrel.

The trade in bacon, pork, lard, cheese, &c., is not very active, though steady and remunerative. Through the politeness of one of the most extensive dealers in these articles, (Mr. James McHenry,) we were shown through his spacious lofts and warerooms, and were surprised at their extent and completeness, and could not but admire the perfect system and order which marks every department. We found that great pains and care are required in the management of bacon, cheese, &c., on its arrival from America, to prevent the articles from spoiling, or to fit them for sale after their appearance has been injured by the voyage, as is quite often the case. Mr. McHenry has every convenience for these purposes; and if we had produce of these kinds to send to England, we should consign them to him, if he would consent. Like many others of the Liverpool merchants, he has travelled extensively in the United States, and in manners and appearance is more American than English.

Ohio cheese, we were glad to find, was gaining in repute at Liverpool, since more care has been taken in the quality and condition of that sent; and Mr. McHenry assures us that a greatly increased trade might be carried on in this

article, if our farmers and shipping merchants would take proper pains to inform themselves as to the style and quality of cheese desired. We hope he will give us further information for our readers on this subject ere long. The price of best quality American cheese here is now from $10.50 to $11 per cwt.; ordinary, $8 to $9.

BRITISH FREE-TRADE ACCURACY.

THE *Journal of Commerce* says: "The great mistake of many persons, in calculating the difference between our imports and exports, arises from the fact that they confine their attention to this port, where the comparison, exclusive of specie, is greatly in favor of the imports. This will be shown by the following statement:—

YEAR ENDING JUNE 30, 1850.

	At New-York.	All other Ports.	Total.
Imports, - - -	$103,250,503	$60,781,530	$164,032,033
Exports, - - -	38,113,735	106,261,990	144,375,725
	$65,136,768		$19,656,308

"Thus New-York showed a nominal excess of imports of sixty-five millions, while the total excess for the whole country was but nineteen millions."

The *Journal* carefully recollects to forget to inform its readers that in addition to an excess of nineteen millions, as shown by the Custom House books, there are *at least twenty millions* of differences between the *sworn value* of imports and the *real one*—twenty-five per cent. difference being considered so reasonable as not to be complained of—and that we thus obtain an excess of imports amounting to thirty-nine millions. In addition to this, we have imported *receipts for the payment of interest* upon two hundred millions of debt contracted under the compromise tariff, and upon sixty, eighty, or a hundred millions of debt contracted under the tariff of 1846, the whole amounting to about seventeen millions of dollars, which, added to the thirty-nine millions, gives a total of FIFTY-SIX MILLIONS of imports in excess of all the food, the cotton, the tobacco, the naval stores, &c. &c., and of all the corn, that we have exported this year; and yet it is but three years since Mr. Walker assured his credulous hearers that the export of food and cotton, and of all other agricultural products, would go on so rapidly, that all the specie we had exported would speedily be returned. His *charlatanism*, and that of the *Journal of Commerce* and the *Union*, are abundantly fit to travel in company with each other.

STONE COAL IN INDIANA.—Recently, as we learn from several of our exchanges, a deposit of stone coal, said to be one hundred and thirty-eight feet deep, has been discovered in Perry county. In this county is the flourishing manufacturing town of Cannelton, the hills in the vicinity of which have long been known to contain an inexhaustible supply of an excellent quality of the mineral. Recent explorations have demonstrated that the whole of Western Indiana abounds in wonderful and exhaustless deposits of this sort.—*Madison (Indiana) Courier, Aug.* 20.

And yet Indiana exports her corn to Britain to be exchanged for iron with which to make her roads, when with the slightest effort she might bring the makers of iron to her vast coal and ore fields, and thus make a market on the land for all the products of the land, and doubling the value of the land. The whole tendency of the policy of Ohio, Indiana, and Illinois, is towards exporting their soil in the form of grain, and thus impoverishing the land, and then exporting men to regions still farther west in quest of new soils to be again exhausted.

NATURAL SCIENCES.

ON THE IMPORTANCE OF AGRICULTURISTS ACQUIRING A KNOWLEDGE OF THE NATURAL SCIENCES AND A HABIT OF ORIGINAL OBSERVATION.

BY JAMES H. FENNELL, AUTHOR OF A "NATURAL HISTORY OF QUADRUPEDS."

NUMEROUS facts on record unite to convince me that agriculturists would find it very advantageous to habituate themselves to making minute examinations of little objects and incidents in nature which occur at every step, but are too often disregarded. It is desirable that agriculturists should not only read books on Natural History, but that they should closely observe with their own eyes everything in the fields, orchards, and gardens, that they may glean some useful hints from Nature's own volume.

In the cultivation of plants, it has been found best to proceed on such scientific principles as a correct knowledge of their structure and functions will suggest. The system of assolements, or the rotation of crops, by which the produce of our land has been quadrupled, and the acclimation of plants by hybridization or engrafting, by which means the fruits and flowers of more southern regions are reconciled to our climate, are only two out of many examples which might be adduced of the benefits conferred by Botany upon Agriculture.

While Science dictates such valuable improvements as these, the mere observation of trifling facts often suggests useful ideas. It is said that the occasional natural union of the boughs of distinct trees demonstrated the practicability of grafting, and that the observation of the circumstance of a vine shooting more vigorously after a goat had browsed on it, suggested the valuable art of pruning fruit-trees. In the sixty-third volume of the *Philosophical Transactions*, we find it related that M. Mustel, having observed that some of the flower-buds of an apple-tree had been gnawed off by a snail, in such a manner that all the petals and stamens had disappeared, being eaten up close to the calyx, which, together with the basis of the pistillum and the embryo, were left uninjured, concluded that those imperfect flower-buds would bear nothing, but was soon convinced of his mistake. Nearly all of them bore fruit; the apples were perfectly formed, and six or seven pretty large ones were seen upon each bunch. On the other hand, the snail had spared some other bunches which it could not so easily get at; but, out of ten or twelve flowers in each of these bunches, not above one or two exhibited any signs of fruit. This suggested to M. Mustel the idea that, when the flowers of trees are full blown, the prevention of the natural fall of the petals and stamens gives a greater assurance of the fructification—a fact which he several times proved; for, having cut off with the scissors the petals of apple, pear, plum, and cherry blossoms, close to the calyx, he found that almost every one of them bore fruit, whilst several of the uncut flowers bore none. Thus did a snail teach him how to render a tree more fruitful.—One of the Emperors of China, having noticed that a particular stalk in his garden produced better rice than the rest, cultivated it for several years; and then, having fully satisfied himself and his subjects of its superiority, he distributed its grains among them for their general benefit. A Sussex farmer, having remarked that some gooseberry bushes, growing under an elder tree, were exempt from the attacks of caterpillars, was induced to try the efficacy of a decoction of elder leaves in destroying the grubs that infested his turnip crops; and he, and other farmers who repeated the experiment, found it successful.

Here I may observe that it is not only necessary that the agriculturist should be well acquainted with the nature of the different vegetables which he cultivates for economic purposes, but that he should rightly understand the causes of the several ravages and diseases to which they are subject, so that he may be able to devise proper remedies and preventions. In this wide field for observation and practice, Natural History will be found a useful guide. In nine cases out of ten, the failure of crops, and the pecuniary loss experienced thereby, arises from the attacks of some particular species of destructive insect, which, from unknown causes, has appeared in unusually great numbers. Before any effectual steps can be taken against it, it is absolutely necessary to ascertain correctly what species of insect is causing the mischief, and to study the creature's habits in all its transformations; for what will prove more or less effectual in one stage of its existence, will be totally useless, or, perhaps, increase the evil in another.—Notwithstanding the immense annual losses which must be caused by the millions of destructive insects that infest all kinds of crops, the science of Entomology is comparatively neglected by agriculturists, who are, therefore, frequently unable to give a definite description of any noxious insect to a naturalist when they require his opinion and advice.

Those husbandmen who have possessed some knowledge of Natural History have not merely been better able to cultivate their plants and protect them from the attacks of hurtful creatures, but they have ascertained thereby what creatures are harmless and useful, and therefore to be spared and encouraged. Without this power of discrimination they may be unwittingly led into the error of destroying creatures which were absolutely beneficial to them. Lady-birds, which are now well known to be most useful little creatures, feeding only upon the hurtful plant-lice, were at one time as mercilessly destroyed as the plant-lice themselves.—We are told by Mr. J. D. Salmon that, in the neighborhood of Scoulton, in Norfolk, there is a very extensive colony of black-headed gulls, *(larus ridibundus,)* which are carefully protected and encouraged by the farmers, who have noticed that they render most useful service by following the plow to feast on the cockchaffer grubs and other insects that it turns up to the surface. So greatly do the farmers value the

assistance of these birds, that they have implored the proprietor of the mere at Stanford Warren to discontinue gathering their eggs. In the first season after their eggs were spared, it was calculated that not less than 15,000 young birds were hatched; and the immense supply of food which this numerous progeny required, greatly increased the exertions of the old birds in obtaining for them many thousands of worms and insects.

Those farmers who, from ignorance, permit poisonous wild plants to spread unchecked, frequently sustain serious losses among their cattle; for though these animals refuse such plants when grown to maturity, yet in the early spring, when there is a deficiency of herbage, and the noxious sorts betray no sensible odor, they will eat, in their extreme eagerness for green food, almost anything that presents itself. Linnæus mentions the death of many cattle from feeding, in early spring, upon the water-hemlock, *(cicuta virosa;)** and, more recently, Mr. Edwin Lees has recorded the death of several fine cows from eating the roots of a poisonous umbelliferous plant which had been carelessly suffered to grow about the sides of a ditch.

Natural History, in its most extensive sense, being inseparably connected with all the arts of life, ought to form a part of the education of those who wish to promote them and to benefit by them. In every school in the kingdom, whether intended for males or females, for the rich or for the poor, Natural History should find a foremost place as an elegant and useful accomplishment. There is hardly a common animal or plant concerning which some egregious error may not be detected in the minds of the generality of what are termed well-educated people, who pride themselves on possessing a *finished* education—finished, indeed, before it had fairly commenced; for they who have learnt anything know that neither man's nor woman's education can ever be complete, as every day of our lives may be made to yield an improvement upon the lessons of our youth. No one will rest content with what he knows to-day, unless he wishes to be a dunce to-morrow. The wisest men love to call themselves students and laborers in the mines of Knowledge, seeking for new facts and even for new sciences that are yet in concealment, and which are destined to improve the earthly condition of man, and to impress him still more strongly with an incessant conviction of the care which God has taken to provide innumerable blessings for His industrious and grateful people—blessings which He has but temporarily hidden from us, so that we have the advantages of labor, health, and hope, in seeking for them. All the world was simply Nature when God completed it; and Natural History, in its widest meaning, is the history of that world of Nature; and, therefore, ignorance of Natural History is ignorance of God's world, which presents the most sublime and useful study man can pursue.

How general the existence of ignorance is on the subject of Natural History may be easily conceived from the absurdities relative thereto which may be found in the writings of even the most popular essayists, novelists, critics, and others who are more literary than scientific.—Latin, Greek, and Heathen mythology have been too frequently learned, to the entire exclusion of any knowledge of those divine works by which we are surrounded, and whereby we may practically benefit ourselves and fellow-creatures. In Sweden, Natural History is the study of the schools by which men rise to preferment; and we are assured by the celebrated botanist, Sir J. E. Smith, that there are no men with more acute or better regulated minds than the Swedes. In the forests of Germany, especially in the small States of the interior—the Hartz, Thuringia, &c.—there are schools in which are taught Surveying and Planting, together with the Zoology, Botany, and Mineralogy of the forest. At one of the most celebrated schools in the world—namely, that of M. De Fellenberg, at Hofwyl, in Switzerland—it is the chief aim of the instructor to inculcate in his numerous pupils the importance of closely examining such surrounding objects of Nature as will most concern them when pursuing the particular professions and trades for which they are intended. The school contains about 450 scholars, among whom are many peasant boys; and no opportunity is lost of directing the attention of all, but especially of the latter, to Nature's works; which are eagerly sought after, attentively studied, and most carefully perused for future reference and instruction. The collecting of these objects affords an employment which is not only amusing and useful, but healthy. The museum thus formed is constantly increasing, both in variety and utility. The plants it contains are not classified scientifically, but according to their properties, uses, and localities.—Seeds and specimens of useful sorts of wood enrich this botanical collection. Quadrupeds, birds, reptiles, and insects are also studied and preserved by the pupils. The winter evenings are instructively spent in this room by the poor children with their master; and on Sundays, after church, they go forth to the hills and woods, seeking fresh treasures for their museum. At Carra, in the neighborhood of Geneva, there is also an agricultural school, where the children are taught the economic Botany of their native country, besides a variety of other useful subjects. They amuse themselves with botanical excursions, and the little students carefully bring home and preserve all the plants which they collect.

Hogg, the Ettrick shepherd, declares that those writers speak falsely who assert that our laborers, herdsmen, and peasants in general, have little or no feeling of the beauty of Nature; and he might have added that they are frequently close observers of her works. This fact induces me to believe that much benefit would arise by giving a more scientific aim to their habit of observation. How readily the shepherd notices slight external differences, even in objects of the same species, is exhibited in his ready discrimination of any one sheep in a flock consisting of even many hundreds, though to the casual observer all the sheep seem exactly alike. Without some nice study of Nature's minute distinctions, the shepherd could not so easily detect any sheep in a large flock.

The aptitude of peasants to receive scientific truths, when their curiosity is properly awakened, might be illustrated by mentioning a glorious list of eminent philosophers who have arisen from the ranks of shepherds, plowmen, &c.—We shall, however, mention but two examples. At Bagis-Beost, near the hot springs of the Pyr-

* A similar plant, *œnanthe crocata*, has lately been discovered by Prof. Christison to be innocuous to man and animals in Scotland, though in the south of England, and also in France and Spain, it has proved itself an active poison. [*Editor.*

enees, lives Gaston Sacaze, whose name has been well known for the last twelve years to philosophical travelers in those parts. Without even quitting his native mountain, or neglecting the care of his flock and the cultivation of his fields, he has found sufficient time to acquire a good systematic knowledge of the Mineralogy, Botany, and Entomology of his native district, entirely unassisted by any teacher except his own eyes and a few books. That he might read the works of Linnæus, he has taught himself Latin. Besides systematically classifying all the mountain plants, he has drawn and colored them, so as to form a rich herbal. At his humble home he has also formed a collection of minerals, stones, insects, &c.; and, when tending his flock, he amuses himself with a violin of his own constructing, and songs of his own composing. So much notice have his talents attracted, that his portrait has lately been taken by the celebrated painter, Devéria. This peasant naturalist calls to mind the instance of John Bertram, the famous Pennsylvanian botanist, who was originally an agricultural laborer, but having his intellectual curiosity excited by an attentive contemplation of a violet, and then dreaming about its beauty and structure, immediately set about learning all the Latin that was requisite to read botanical works.

Great Britain abounds in grammar schools for the poor, but where can it show anything like the forest schools of Switzerland, Sweden, and Germany? Where are the instructors to teach our peasantry those sciences which they would be practically benefited by understanding?—We want to see a full consummation of the benevolent wish of Dr. Drummond, that a lecture-room, a museum, and a useful library should be attached to every village, as regularly as its church or chapel; and that a portion of time should be appropriated to teaching Natural History, and even Natural Theology, to the peasantry. Geology and Agricultural Chemistry should also be made to throw their light upon the laborer's mind, and his children should be taught something about these subjects, as well as grammar and ciphering. Agriculture would more rapidly attain to perfection, if all, without exception, who are concerned in it, were made clearly to understand the processes on which its fullest success depends. The laborer could not fail to become more skillful and more interested in his employment, if he were taught to practice it as a science, and not merely as a toil.

The culture of plants will become a comparatively easy process when we are better acquainted with their peculiar functions, and with the chemical elements which they require for their growth and maturation. We must not be content with knowing what are their respective natural localities, climates, and seasons, but must learn what chemical gases each species imbibes from the atmosphere, through its leaves, and what substances from the soil, through its roots. "If a plant be distinguished by its containing a notable proportion of soda, silica, &c. the soil in which it is to be grown must," as a writer in the *Edinburgh Journal* justly observes, "contain these elements, otherwise the attempt will be abortive;" for a plant can no more create soda or silica within itself than it can form water for its support, independent of the soil or atmosphere. From a knowledge of the principles, therefore, a rational theory of Agriculture may be formed; and what has hitherto been little better than an expensive and often distressing system of trial and error, becomes a science guided by fixed laws. Agriculture will always have to contend with the fluctuations of season and climate; but it is for human ingenuity to modify their influence, and this can only be effected by rational and scientific procedure. As yet, the science of Agriculture is only in its infancy; but the time is not far distant when it will rank with other maturer branches of knowledge—when every soil will be systematically treated for the species of crop to be raised upon it—when manures will be manufactured as we now manufacture soda and sulphuric acid—when plants will be fed and stimulated as we now treat animals—in short, when the farmer will sow and reap with as much security as the distiller produces his spirit. The value of the science of Chemistry to the agriculturist may be judged from the fact that, when the great French chemist, Lavoisier, took a quantity of land into his own cultivation, he very soon succeeded in doubling its produce.

If the proprietor of land would explore its mineral productions with a view to speculation in them, he ought previously to obtain some knowledge of Geology. To an ignorance of this subject may be traced the lavish expenditure of money in many futile attempts to find coal in situations where the slightest regard to the principles that have been established, and the rules that have been discovered, relative to the association of coal with certain stratified rocks, would have saved those individuals from ruin and misery. As a striking example of the serious consequences that have ensued from seeking coal without acting under the guidance of geological principles, Sir John Herschel relates that an attempt was made, not many years since, to establish a colliery at Bexhill, in Sussex—the appearance of thin seams and sheets of fossil wood and wood coal, with some other indications similar to what occur in the neighborhood of the great coal beds in the north of England, having led to the sinking of a shaft, and the erection of machinery on a scale of vast expense. Not less than £800,000 are said to have been expended in this project, which, it is almost needless to add, proved completely abortive, as every geologist would at once have declared it must—the whole assemblage of geological facts being adverse to the existence of a regular coal bed in the Hastings strata; while this, on which Bexhill is situated, is separated from the coal measures by a series of interposed beds, of such enormous thickness as to render all idea of penetrating through them absurd.—The history of mining operations is full of similar cases, where a very moderate acquaintance with the usual order of Nature, to say nothing of theoretical views, would have saved many a sanguine adventurer from utter ruin.

In learning the nature of the underlying soils, and the character of the surface soil, which in many instances depends upon the decomposition of the subterraneous strata, Geology affords most valuable assistance. From the mere description of the character of any line of country, the geological agriculturist might form a tolerably accurate notion as to what must be the productions, pursuits, wants, and even the general constitutions of the inhabitants; and, if he possessed a knowledge of Geological Botany and Geological Entomology, he would also be able to predict what genera of plants and insects were there most plentiful. Geology could point out to him stores of lime and mineral manure in

places where they were not generally known to exist. Without an ample supply of water, no farming can be prosperously conducted; and here again Geology comes to our aid, and suggests the formation of those Artesian wells which have given the precious blessing of water to many previously dry districts, as in France and various parts of England. Observation on the surface of the earth detects the deep reservoirs below. "Search and ye shall find;" for wherever deposits of a light and porous nature occur in hollows and depressions of firmer and older rocks, water will penetrate until it has accumulated into immense subterranean pools—the pressure of the superior strata preventing the fluid from exhibiting itself to the eye, except in slight oozings at the indented parts of the surface. When proper borings are made through the strata, the water is released from its confinement, and rushes up copiously from the valley or hollow. Beneath those spots of ground over which swarms of gnats are continually seen dancing in the air, the existence of wells may be suspected; for these insects disport themselves always where there is the greatest evaporation. It was by a secret knowledge of this fact that the professors of the divining rod detected hidden wells. Slight superficial observation may also detect concealed mineral springs, which may add to the value of an estate. Thus the discovery of the chalybeate spa at Dorton, in Buckinghamshire, originated from some villager's attention being attracted to the circumstance that a little stream, which issued from a small orifice, destroyed the plants that came within its course; the few blades of grass that were spared bore a thick incrustation of oxide of iron; and the surface of the ground, which, for a few yards on either side of its channel, assumed a yellow and scorched appearance, was covered with a similar metallic deposit. The peasants called it the *Alum* Well—the taste of that substance being most apparent to them. It was also observed here, as at the Bath waters, that diseased cattle voluntarily and repeatedly repaired to the little stream, and rapidly recovered from their maladies. It was noticed that it afforded great relief to horses suffering from that very obstinate and almost incurable disorder, the mange. Owing to the powerful chalybeate qualities of this water, the manure of the cattle that drink of it will burn to a cinder, and is collected for fuel, in the same way that the Peruvian miners and mountaineers make bright and clear fires of the dung of the llamas and alpaccas.

These several facts will, I trust, suffice to show to every reader the policy of the agriculturist greatly enlarging his present sphere of knowledge, and the frequent advantages that would result from his practicing a habit of original observation, with a view of deriving important suggestions from apparently trifling facts.

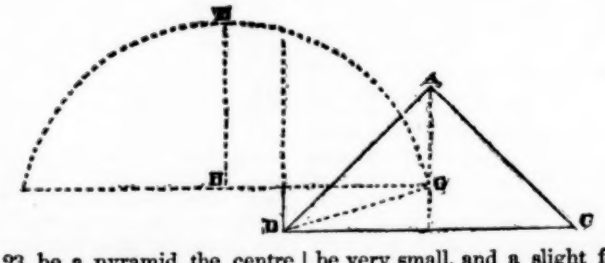
[Jour. of High. and Agri. Soc. of Scotland.

THE CENTRE OF GRAVITY.

We have heretofore alluded, but only incidentally and scarcely in a way to make ourselves understood, to the various studies which, (although the connexion is not at first apparent,) are yet necessary to the most efficient practice of the Agricultural art. Among these, the *general principle of Mechanics* should be esteemed as of the highest importance. We will suppose them to be inculcated in Common Schools, by means of lectures and illustrations, clear and simple as we find the following, for instance, in part of one of *Dr. Lardner's Lectures* on THE CENTRE OF GRAVITY; and who does not see how useful through life would be tuition of this sort:

When the line of direction falls within the base, bodies will always stand firm, but not with the same degree of stability. In general, the stability depends on the hight which the centre of gravity must be elevated before the body can be overthrown. The greater this hight is, the greater in the same proportion will be the stability.

Fig. 23.



Let B A C, fig. 23, be a pyramid, the centre of gravity being at G. To turn this over the edge B, the centre of gravity must be carried over the arch G E, and must therefore be raised through the hight H E. If, however, the pyramid were taller relatively to its base, as in fig. 24, the hight H E would be proportionally less; and if the base were very small in reference to the hight, as in fig. 25, the hight H E would be very small, and a slight force would throw it over the edge B.

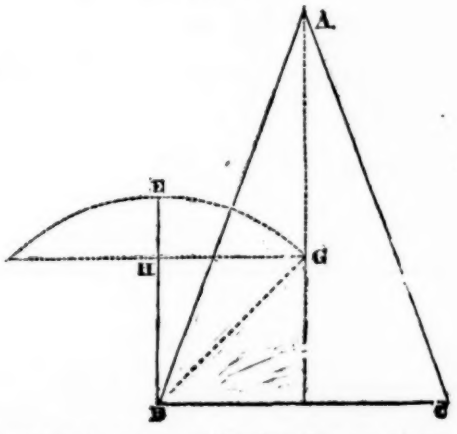
It is obvious that the same observations may be applied to all figures whatever, the conclusions just deduced depending only on the distance of the line of direction from the edge of the base, and the hight of the centre of gravity above it.

Hence we may perceive the principle on

which the stability of loaded carriages depends. When the load is placed at a considerable elevation above the wheels, the centre of gravity is elevated, and the carriage becomes proportionally insecure. In coaches for the conveyance of passengers, the luggage is therefore sometimes placed below the body of the coach; light parcels of large bulk may be placed on the top with impunity.

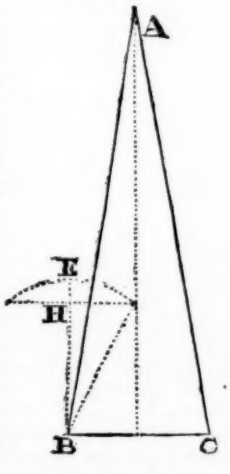
When the centre of gravity of a carriage is much elevated, there is considerable danger of overthrow, if a corner be turned sharply and with a rapid pace; for the centrifugal force then acting on the centre of gravity will easily raise

Fig. 24.



it through the small hight which is necessary to turn the carriage over the external wheels.

Fig. 25.



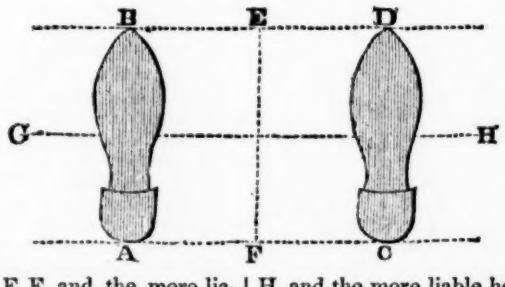
The same wagon will have greater stability when loaded with a heavy substance which occupies a small space, such as metal, than when it carries the same weight of a lighter substance, such as hay; because the centre of gravity in the latter case will be much more elevated.

If a large table be placed upon a single leg in its centre, it will be impracticable to make it stand firm; but if the pillar on which it rests terminate in a tripod, it will have the same stability as if it had three legs attached to the points directly over the places where the feet of the tripod rest.

When a solid body is supported by more points than one, it is not necessary for its stability that the line of direction should fall on one of those points. If there be only two points of support, the line direction must fall between them. The body is in this case supported as effectually as if it rested on an edge coinciding with a straight line drawn from one point of support to the other. If there be three points of support, which are not ranged in the same straight line, the body will be supported in the same manner as it would be by a base coinciding with the triangle formed by straight lines joining the three points of support. In the same manner, whatever be the number of points on which the body may rest, its virtual base will be found by supposing straight lines drawn, joining the several points successively. When the line of direction falls within this base, the body will always stand firm, and otherwise not. The degree of stability is determined in the same manner as if the base were a continued surface.

Necessity and experience teach an animal to adapt its postures and motions to the position of the centre of gravity of his body. When a man stands, the line of direction of his weight must fall within the base formed by his feet. If A B C D, fig. 26, be the feet, this base is the space A B C D. It is evident that the more his toes are turned outward, the more contracted the base

Fig. 26.



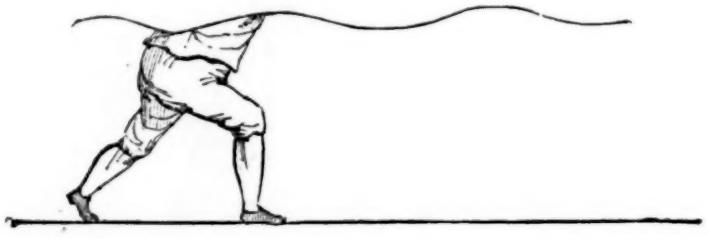
will be in the direction E F, and the more liable he will be to fall backward or forward.—Also the closer his feet are together, the more contracted the base will be in the direction G H. and the more liable he will be to fall toward either side.

When a man walks, the legs are alternately lifted from the ground, and the centre of gravi-

ty is either unsupported or thrown from one side to the other. The body is also thrown a little forward, in order that the tendency of the centre of gravity to fall in the direction of the toes may assist the muscular action in propelling the body. This forward inclination of the body increases with the speed of the motion.

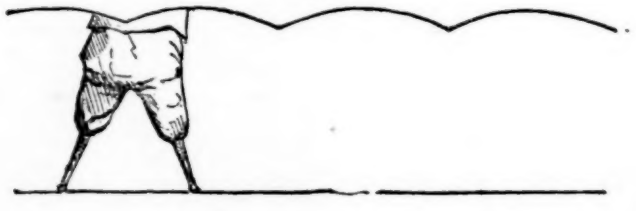
But for the flexibility of the knee-joint, the labor of walking would be much greater than it is; for the centre of gravity would be more elevated by each step. The line of motion of the centre of gravity in walking is represented by fig. 27, and deviates but little from a regular horizontal line, so that the elevation of the centre of gravity is subject to very slight variation. But if there were no knee-joint, as when a man has wooden legs, the centre of gravity would move as in fig. 28, so that at each step the weight of the body would be lifted through a considerable hight, and therefore the labor of walking would be much increased.

Fig. 27.



If a man stand on one leg, the line of direction of his weight must fall within the space on which his foot treads. The smallness of this space, compared with the hight of the centre of gravity, accounts for the difficulty of this feat.

Fig. 28.



The position of the centre of gravity of the body changes with the posture and position of the limbs. If the arm be extended from one side, the centre of gravity is brought nearer to that side than it was when the arm hung perpendicularly. When dancers, standing on one leg, extend the other at right angles to it, they must incline the body in the direction opposite to that in which the leg is extended, in order to bring the centre of gravity over the foot which supports them.

Fig. 29.

When a porter carries a load, his position must be regulated by the centre of gravity of his body and the load taken together. If he bore the load on his back, fig. 29, the line of direction would pass beyond his heels, and he would fall backward. To bring the centre of gravity over his feet, he accordingly leans forward, fig. 30.

If a nurse carry a child in her arms, she leans back for a like reason.

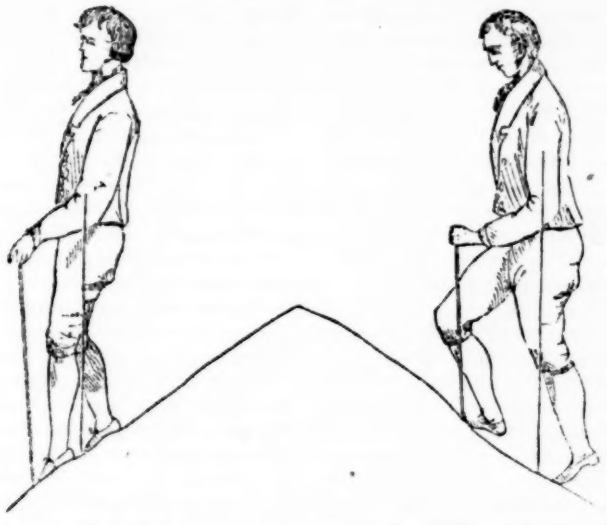
When a load is carried on the head, the bearer stands upright, that the centre of gravity may be over his feet. In ascending a hill, we appear to incline forward, and in descending, to lean backward; but in truth we are standing upright with respect to a level plane. This is necessary to keep the line of direction between the feet, as is evident from fig. 31.

Fig. 30.

A person sitting on a chair which has no back, cannot rise from it without either stooping forward to bring the centre of gravity over the feet, or drawing back the feet to bring them under the centre of gravity.

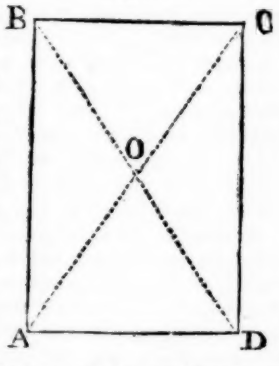
A quadruped never raises both feet on the same side simultaneously, for the centre of gravity would then be unsupported. Let A B C D, fig. 32, be the feet. The base on which it stands is A B C D, and the centre of gravity is nearly over the point O, where the diagonals cross each other. The legs A and C being raised together, the centre of gravity is supported by the legs B and D, since it falls between them; and when B and D are raised, it is, in like manner, supported by the feet A and C. The centre of gravity, however, is often unsupported for a moment; for the leg B is raised from the ground

Fig. 31.



before A comes to it, as is plain from observing the track of a horse's feet, the mark of A being upon or before that of B. In the more rapid paces of all animals the centre of gravity is at intervals unsupported.

Fig. 32.



The feats of rope-dancers are experiments on the management of the centre of gravity. The evolutions of the performer are found to be facilitated by holding in his hand a heavy pole. His security in this case depends, not on the centre of gravity of his body, but on that of his body and the pole taken together.—This point is near the centre of the pole, so that, in fact, he may be said to hold in his hands the point on the position of which the facility of his feats depends. Without the aid of the pole, the centre of gravity would be within the trunk of the body, and its position could not be adapted to circumstances with the same ease and rapidity.

The centre of gravity of a mass of fluid is that point which would have the properties which have been proved to belong to the centre of gravity of a solid, if the fluid were solidified without changing in any respect the quantity or arrangement of its parts.

THE PRINCIPLES OF ARTIFICIAL MANURING.

BY PROFESSOR JUSTUS LIEBIG.

If we compare the experience of farmers regarding the fertility of the soil and the quantity of its productions, we are surprised by a result which surpasses all others in general application and uniformity.

It has been observed, that in every part of the globe where Agriculture is carried on, in all varieties of soil, and with the most different plants and modes of cultivation, the produce of a field on which the same or different plants have been cultivated during a certain number of years, decreases more or less in quantity, and that it again obtains its fertility by a supply of excrements of man and animals, which generally are called manure; that the produce of the fields can be increased by the same matters, and that the quantity of the crop is in direct proportion to the quantity of the manure.

In former times scarcely any attempt was made to account for the cause of this curious property of the excrements of man and animals. Without taking into consideration the origin of the excrements and the relation they bear to the food, it is not astonishing that their effect was ascribed to a remnant of vital power which should qualify them to increase the vitality in plants. Ascribing their influence on the fertility of the fields to an incomprehensible occult cause, it was forgotten that every force has its material substratum; that with a lever, in a mathematical sense,

which possesses no extension and gravity, no effect can be produced, no burden raised.

Guided by experience, which is the fundamental basis of all inductive science, and which teaches us that for every effect there is a cause, that every quality, as, for instance, the fertility of a field, the nourishing quality of a vegetable, or the effect of a manure, is intimately connected with and occasioned by something which can be ascertained by weight and measure; modern science has succeeded in enlightening us on the cause of the fertility of the fields and on the effects which are exercised on them by manure.

Chemistry has shown that these properties are produced by the composition of the fields; that their fitness for producing wheat or any other kind of plant bears a direct proportion to certain elements contained in the soil, which are absorbed by the plants. It has likewise shown that two fields, of unequal fertility, contain unequal quantities of these elements; or that a fertile soil contains them in a different form or state from another, which is less fertile. If the elements are contained in the soil in sufficient quantities, it produces a rich crop; if it be defective even in one of them only, this is shown very soon, by the impossibility of growing on it certain kinds of plants.

Moreover, it has proved with certainty what relations these elements of the soil bear to the development of the plants. Chemical analysis has demonstrated that a certain class of these elements is contained in the seeds; others, in different proportions, in the leaves, roots, tubers, stalks. They are mineral substances, and as such, are indestructible by fire, and consequently remain as ashes after the incineration of the plants or of their parts. Many of these elements are soluble in pure water, others only in water containing carbonic acid, as rain-water; all were absorbed from the soil by the roots of the plants in a dissolved condition. It has been shown that, in a field, those elements which remain after the incineration of the grain or seeds, are not present in a sufficient quantity, no wheat, no barley, no peas—in a word, none of those plants can be cultivated on that field which are grown on account of their seeds. The plants which grow on such a field produce stalks and leaves; they blossom, but do not bear fruit. The same has been observed regarding the development of leaves, roots and tubers, and the mineral elements which they leave behind after their incineration. If, in a soil in which turnips or potatoes are to be cultivated, the elements of the ashes of these roots are wanting, the plants bring forth leaves, stalks, blossoms and seeds, but the roots and tubercles are imperfect. Every one of the elements which the soil gives up to the plants is in a direct quantitative proportion to the production of the separate elements of the plants. Two fields, which, under otherwise equal circumstances, are unequally rich in mineral elements of the grain, produce unequal crops. One containing them in larger quantity produces more than another containing them in less. In the same manner, the capacity of a soil to produce tuberculous plants, or such as have many leaves, depends upon its amount of those elements which are feund in the ashes of such plants.

It results from this with certainty, that the mineral substances which are furnished by the soil, and which are found again in the ashes of plants, are their true food; that they are the conditions of vegetable life.

It is evident, that from a field in which dif ferent plants are cultivated, we remove with the crop a certain quantity of these elements; in the seeds those mineral parts which the soil had to provide for *their* development, and in the roots, tubercles, stalks and leaves those elements which are necessary for *their* production. However rich the field may be in these elements, there can be no doubt that, by several cultures, it becomes more and more impoverished; that for every plant a time must arrive when the soil will cease to furnish, in sufficient quantity, those elements which are necessary for a perfect growth. Even if such a field, during many years, had produced twenty-five or thirty fold the amount of the seed, for instance, of wheat, experience shows that the crop gradually decreases, until at last the amount will be so small as to approach the plant in its wild state, and not repay the cost of cultivation.

According to the unequal quantity in which the mineral elements of grain, tubercles, roots, seeds, leaves, are contained in a soil, or according to the proportions in which they have been removed in the crop, the land may have ceased to be fertile for roots and tubercles, but it may yet produce good crops of wheat. Another may not produce wheat, but potatoes and turnips may thrive well in it. The mineral substances contained in a fertile soil, and serving as food to the plants, are taken up by them with the water, in which they are soluble. In a fertile field they are contained in a state which allows of their being absorbed by the plant and taken up by the roots. There are fields which are rich in these elements, without being fertile in an equal proportion; in the latter case they are united with other elements into chemical compounds, which counteract the dissolving power of water. By the contemporaneous action of water and air—of the oxygen and carbonic acid of the atmosphere—these compounds are decomposed, and those of their constituent elements, which are soluble in water, but which had been insoluble by the chemical affinity of other other mineral substances, reöbtain the property of being absorbed by the roots of the plants.

The duration of the fertility of a field depends on the amount of the mineral aliments of plants contained in it, and its productive power for a given time is in a direct proportion to that part of its composition which possesses the capacity of being taken up by the

plant. A number of the most important agricultural operations, especially the mechanical, exercise an influence on the fertility of the fields only thus far, that they remove the impediments which are opposed to the assimilation of the mineral food into the vegetable organism. By plowing, for instance, the surface of the field is made accessible to air and moisture. The nutritious elements contained in the soil in a latent state, acquire, by these operations, the properties necessary for their transmission into the plants. It is easy to conceive the useful influence which, in this respect, is exercised on the produce of the fields by the care and industry of the farmer. But all these labors and efforts do not increase the amount of mineral elements in the field: in rendering soluble in a given time a larger quantity of the insoluble substances, and obtaining by these means a richer crop—the time is merely hastened in which the soil becomes exhausted.

The experience of centuries has shown that, with the aid of manure, of the excrements of animals and man, with which we supply those fields which have ceased to produce crops of grain, &c., serving as food for man and animals, in a sufficient quantity, the original fertility can again be restored; an exhausted field, which scarcely yielded back the seed, is made to produce a twenty and more fold crop, according to the proportion of the manure provided.

Regarding the mode of action of manures, it has been observed that all excrements do not exercise an equal influence on plants. The excrements of sheep and cattle, for instance, increase in most fields the crop of roots and herbaceous plants to a far greater degree than those of man and birds, (guano.) The latter act far more favorably on the production of grain crops, especially if they are added to the animal excrements, and are given to the fields at the same time.

A field, for example, which has lost its fertility for potatoes and turnips, but on which peas and beans still thrive, becomes far more fertile, by a supply of the excrements of horses and cows, for a new crop of potatoes and turnips, than by manuring it with the excrements of man or with guano.

The most accurate experiments and analyses have pointed out that the excrements of man and animals contain those substances to the presence of which the fertility of the soil is due. The fertilizing power of manure can be determined by weight, as its effect is in a direct ratio to its amount in the mineral elements of the food of plants. The truth of the result of these chemical analyses must be evident to every one who inquires into the origin of excrements.

All the excrements of man and animals are derived from the plants of our fields; in the oats and hay which serve as food for the horse, in the roots which are consumed by a cow, there is a certain quantity of mineral ingredients. A horse, in consuming 15 lbs. of hay and 4½ lbs. of oats per day, consumes 21 ounces of those substances which the hay and the oats took from the fields; he consumes annually 480 lbs. of these constituent elements of the soil, but only a very small portion of them remains in his body. If a horse, during one year, increases 100 lbs. in weight, this increase contains only 7 lbs. of those mineral substances which were contained in the food. But what has become of the 473 lbs. which we cannot detect in his body?

The analysis of the fluid and solid excrements which the horse gives out daily, shows that the ingredients of the soil which do not remain in the body of the animal are contained in its excrements; it shows that in an adult animal, which from day to day neither increases nor decreases in weight, the amount of the mineral ingredients of the excrements is equal in weight to the mineral ingredients of the food.

As with the horse, so it is with all animals. *In all adult animals the excrements contain the ingredients of the soil according to the quantities and relative proportions in which they are contained in their food.*

The mineral substances of the food which have remained in the body of the animals, and served to increase their weight, are found again in the bones and excrements of man, who consumes the flesh of these animals.

The excrements of man contain the elements of the soil, of bread or of grain, of vegetables and meat.

These discoveries explain, in a most simple and satisfactory manner, the fertilizing effect which manure produces on our fields.

It is now obvious why manure renders again fertile the exhausted fields; why, by its means, their productiveness can be augmented; why the latter is in a direct ratio to the quantity of manure administered.

The exhaustion of the soil by subsequent crops, its decrease in fertility, is produced by the gradual removal of the mineral elements, in a soluble state, which are necessary for the development of our cultivated plants. By a supply of manure they are again restored to the state suited to serve as nourishment to a new vegetation.

If the supply of the removed elements of the soil, by means of manure, be sufficient, if the quantity taken away be restored, the original fertility reäppears; if the supply be greater, the produce increases; a defective supply gives a smaller produce.

It is now explained why the different kinds of manure exercise an unequal effect upon the fields.

The excrements of man and guano, containing especially the mineral ingredients of grain and of meat, exercise far greater influence on the amount of produce of grain in a field in which these ingredients are wanting, even if those of the leaves and stalks are present in sufficient quantity, than the excrements of an animal which feeds on roots or green fodder.

The excrements of the latter contain the mineral elements of the leaves, stalks, and roots in prevailing quantity, and have a greater value for the production of roots and foliaceous plants than those of man or of birds, which contain only a small quantity of those mineral substances which they require for their development.

If we compare, for instance, the composition of guano with the excrements of the cow—solid and fluid excrements in the same state of dryness—it is found, that in an equal weight, the latter contain five to seven times more of the mineral ingredients of turnips and potatoes than the former. If, in a soil which is deprived of all those mineral substances, we wish to force a crop of turnips by means of guano, we require at least five times more of guano than dung of cattle.

The same thing happens, though *vice versa*, if we wish to produce a rich crop of grain by means of animal excrements; in this case, one part of guano and five parts of animal excrements, produce the same effect as thirteen to fifteen parts of animal excrements.

To understand the proper meaning of these numerical proportions, it is sufficient to mention that 400 lbs. of bones contain as much phosphoric acid as 1,000 lbs. of wheat; these 400 lbs. of bones can furnish sufficient phosphoric acid to eight acres.

If we take the importation of bones into Great Britain in the last ten years to amount to 1,000,000 of tons, enough phosphoric acid has been supplied to the fields for 25,000,000 tons of wheat; but only a small proportion of the phosphoric acid of the bones is in a state to be assimilated by the plants and applied to the formation of grain. The plants, in order to apply the other far greater part of the phosphoric acid to their formation, must find a certain quantity of alkaline bases beside the bone-earth, which are not given to the plants in the bones, because they contain neither potash nor soda.

To have increased the fertility of the fields in the right proportion, 300,000 tons of potash ought to have been added to the 1,000,000 tons of bones, in a suitable form.

The same is the case with guano: 60 to 100 lbs. of it are sufficient to furnish phosphoric acid to one acre of turnips; but the four to eightfold quantity is required to furnish the turnips with the necessary alkaline bases, and it is still doubtful whether they can be at all provided with the latter, by means of the salts with the alkaline bases, which the guano contains.

At a time when the necessity of the mineral substances for the growth and development of plants, and the direct relation which the effect of manure has to its amount of the same substances, had not been ascertained, a prominent value was ascribed to the organic matters which it contains. For a long time it was thought that the produce of a field of those substances containing nitrogen, which serve as food for man and animals, stood in a direct proportion to the nitrogen contained in manure. It was believed that its commercial value, or its value as manure, might be expressed in per cents. by its proportion of nitrogen, but later and more convincing observations have induced me to contradict this opinion.

If the nitrogen and carbonic acid formed by the decay and decomposition of the vegetable ingredients of manure were the cause of its fertilizing power, this ought also to be seen if the mineral substances were excluded. Direct experiments have shown that the nitrogen of the excrements can be assimilated by the plants in the form of ammonia, but that ammonia, as well as carbonic acid, although it is indispensable for the development of all plants, can accelerate the growth of plants and increase the produce of a field of grain, roots and tubercles *only*, if, at the same time, the mineral ingredients contained in the manure which is applied, are in a state in which they are suited for assimilation. If the latter are excluded, carbonic acid and ammonia have no effect on vegetation.

On the other hand, experience has shown that on many fields produce which is rich in carbon and ammonia, can be increased to an extraordinary amount, without any supply of such matters as furnish these substances.

On fields which are provided with a certain quantity of marl or slaked lime, or with bone-earth and gypsum—substances which cannot give up to the plants either carbon or nitrogen—rich crops of grain, tubers and roots are obtained in many places, entirely in contradiction with the view which ascribes the effect of the manure to its amount of ingredients containing nitrogen or carbonic acid.

To explain this process, which is so opposite to the common opinion, the marl, the lime, the gypsum, the alkalies and the bone-earth were regarded as stimulants, which acted on the plants like spices on the food of man, of which it was believed that they increased the power of assimilation, and allowed the individuals to consume larger quantities of food.

This view is contradicted, if we consider that stimulants mean such substances as do not serve for the nourishment of the organism or for the formation of organic elements, and can only increase the weight of the body, if at the same time a certain increase of food is given. In supplying the fields with the above mentioned substances, the weight of the plants became increased in all their separate parts, without their having been provided with the quantity of food which according to theory, was necessary to this extraordinary increase—viz., with carbonic acid and ammonia.

Chemical analysis shows that these so-called stimulants are either actual ingredients of manure, as gypsum, bone-earth and the active substances of the marl, or that they are the means by which the mineral elements contained in the soil are resolved into a state

adapted for being assimilated by the plants; this is generally effected by the application of slaked lime. They consequently exercise on the vital process of the plants not a mere stimulus like the spices, but are consumed for the development of the leaves, seeds, roots, &c., they become constituent parts of them, as can be shown with certainty by chemical analysis.

The success which has followed the application of these substances to the fields has explained, in a most striking manner, the origin of the carbon and nitrogen in the plants.

In the marl, in the bone-earth, in the gypsum, in the nitrate of soda, no carbon is provided to the fields; and yet, in many cases, the same produce, in some even a higher one, is obtained, than by the application of a manure containing carbon and nitrogen. As the soil, after the crop, does not contain less carbonaceous or nitrogenous substances, it is evident that these products, which had been obtained without any carbonic or azotic manures, must have got the carbon and nitrogen of their leaves, roots and stalks from the atmosphere; it follows, therefore, that the productiveness of the fields cannot be increased in proportion with a supply of carbonaceous and azotic substances, but that the fertility depends only on the supply of those ingredients which should be provided by the soil.

The soil not only serves the purpose of fixing the plants and their roots; it participates in vegetable life through the absorption of certain of its elements. If these elements are present in sufficient quantity, and in appropriate proportions, the soil contains the conditions which render the plant capable of absorbing carbonic acid and ammonia from the air, which is an inexhaustible storehouse for them, and renders their elements capable of being assimilated by their organism.

The agriculturist must, therefore, confine himself to giving to the field the composition necessary to the development of the plants which he intends to grow; it must be his principal task to supply and restore *all* the elements required in the soil, and not only one, as is so frequently done; the ingredients of the air, carbonic acid and ammonia, the plants can, in most cases, procure without man's interference; he must take care to give to his field that physical condition which renders possible and increases the assimilation of these ingredients by the plant; he must remove the impediments which diminish their effect.

The favorable influence which bone-earth, gypsum, nitrate of soda, exercise on the fields has induced many farmers to the belief, that in applying them they can dispense with manure or with the other elements of the soil; it requires, however, only little attention to see the great error of this opinion. We observe that the effect of these substances is not equal on all fields; in one place the amount of produce is increased by the lime, by the bone-earth, and by gypsum; in another country, or on other fields, these substances in no way favor vegetation. From this arise the contradictory views of farmers regarding these matters as manures. If one farmer thinks the liming of his fields quite indispensable for rendering them fertile—another declares that lime produces no effect at all.

The reason of this difference is very simple. The examination of a soil upon which lime has had no effect, shows that it was already rich in this substance: it farther shows that its effect extends only to those kinds of soil in which lime is wanting, or in which it is found in too small a quantity, or in a condition which is not suited to its assimilation by the plant. Lime especially serves for resolving the silicates of alumina (clay) and consequently it cannot fertilize soils in which clay is wanting, for instance, sandy soils. It must be apparent to every one, that on the calcareous and gypseous fields of France and England one-half per cent. of gypsum or lime can have no influence at all on vegetation. This can be said with equal justice of bone ashes, and of every other mineral substance serving for the nourishment of plants.

If these substances exercise a favorable effect, some of the constituents of the soil or manure are restored, which are indispensable to the nourishment of plants, and which have been wanting in the soil. If this be the case the other bodies, equally necessary, must be present in sufficient quantity. On a field in which sulphate of lime has acted favorably, but in which clover had been cultivated without it, the crop was 2,200 pounds of clover-hay, in which 53 pounds of potash were removed. On the same field, after it had been dressed with gypsum, 8,000 pounds of hay were produced, which contained 191 pounds of potash. If this potash had not been present in the soil, the gypsum would have had no effect—the crop would not have been increased. On fields which are richly provided with all other mineral ingredients, with the exception of gypsum, the latter is applied with the greatest success. But if gypsum is present in the soil, the same effects are produced by ashes and lime, as is the case in Flanders. On fields in which phosphate of lime is wanting, bone ashes increase the produce of grain, clover, or grass, and on argillaceous soil, lime produces a decided improvement. All these substances act only on those fields which are defective in them, and if the other elements of the soil are present. The latter cause the former to come into action, and *vice versa*. The farmers who thought that by using lime, gypsum, bone-earth, &c., they might dispense with animal manure, very soon observed that their fields deteriorated. They observed that after a third or fourth successive manuring with those simple substances the produce decreased; that, as is the common expression, the soil became tired of the manure, that at last the field scarcely produced the seed.

It is evident from this, what is the action of the mineral elements in the soil. If in fact

in the first years, the produce of the soil had increased by the application of bone ashes, or by a single element of the manure—if this increase was dependent on the amount in the soil of the other mineral elements, a certain quantity of those was annually taken up by the plants and removed in the harvest, and a time must at last arrive in which it is exhausted by the repeated removal; the soil must become barren, because of all removed elements only one or the other, and not all of them in a right proportion, have been restored.

The right proportion of the supply is, however, the only true scientific basis of Agriculture.

If we subject the fluid and solid excrements of men and animals to an exact analysis, and compare the elements of them according to their weight, some constant relations between these elements impress themselves upon the mind, the knowledge of which is of some importance.

If the excrements of an animal are collected with some care and left to themselves for some days, their nitrogen appears to have been converted more or less perfectly into ammonia. In the fluid excrements, in the urine, the salts of the food, which are soluble in water, are found in the form of alkaline carbonates, or of sulphates, phosphates, and other salts, with alkaline bases. In the solid excrements or fæces, silica, if it was contained in the food, earthy carbonates, and phosphates are the principal ingredients.

The quantity of alkaline carbonates bears a certain proportion to the amylum, sugar, pectine, or gum of the food. The urine of an animal which has been fed with potatoes or turnips, is rich in alkaline carbonates; the potatoes, however, consist principally of amylum; the chief ingredients of the turnips are sugar and pectine. The urine of a horse which has been fed with hay and oats, is comparatively poor in alkalies, if compared with the former.

It is farther shown that the ammonia or the nitrogen of the excrements bears a certain proportion to the phosphates; the azote increases or decreases with the quantity of the phosphates in a manner that both can serve as a measure for each other, although not quite as an accurate one. It is not quite accurate, because the gum and the amylum also contain a certain, although small, quantity of phosphate of lime, as has been proved in my laboratory.

The ammonia of the excrements is of course derived from the nitrogenous substances in the food: the phosphates are likewise constituents of the latter. In the composition of the food an equally constant proportion exists between both. A given weight of gluten or casein in peas or in grain always corresponds with a certain weight of phosphates; if the grain or the vegetable is rich in these nitrogenous products of vegetable life, it is also rich in phosphates; if it is deficient in them the quantity of the latter decreases in an equal ratio.

As the amount of nitrogen in manure is a measure for its amount of phosphates, and as the manure contains besides these the other ingredients of the soil which are required by the grain or by the other vegetables for their development, and taken up by them from the soil, it is easily conceived what was the cause of the error in regarding the nitrogen of the manure as the principal cause of its efficacy. The reason was, that the ammonia of the manure is always accompanied by the mineral elements which affect its nourishing qualities, because they render its assimilation into the organism of the plant, and its transition into a nitrogenous constituent, possible Without phosphates, and without the other mineral elements of the food of plants, the ammonia exercises no influence whatever upon vegetable life

If it has been shown that the fertility of the soil depends on certain mineral substances; if the restoration of the fertility of exhausted fields by means of the excrements of man and animals depends on their proportions of these matters; if the effect of the manures *accelerating* the vegetation depends upon their proportions of ammonia, it is clear that we can only dispense with the latter when we provide *all* efficacious elements exactly in those proportions and in that form most proper for assimilation by the vegetable organism in which they are found, in the most fertile soil or in the most efficacious manure.

According to our present knowledge of the effect of the constituent parts of manure, I feel convinced that it is indifferent to the plants from which source they are derived. The dissolved apatite (phosphate of lime) from Spain, the potash derived from felspar, the ammonia from the gas-works, must exercise the same effects on vegetable life as the bone-earth, the potash, or ammonia, which we provide in manure.

We live in a time when this conclusion is to be subjected to a comprehensive and accurate trial, and if the result corresponds with the expectations which we are entitled to form, if the animal excrements can be replaced by their efficacious elements, a new era of Agriculture must begin.

I invite the enlightened farmers of England to unite with me for that purpose, and to lend me their aid. Whatever may be the result of these experiments, it is necessary for the future prosperity of Agriculture that they should be made. They will enrich us with a number of valuable facts—we shall ascertain where we have wasted efficacious matters in the common course of farming—we shall acquire an exact knowledge of those substances which are necessary and of those which are dispensable.

For a number of years myself and many talented young chemists have been occupied with the analysis of those mineral substances

which are constituent elements of our plants of culture, and with the examination of the excrements of man and animals, as well as of a great number of soils acknowledged as fertile. These labors have been before the scientific world long since, but only a very confined application has been made of them in agriculture.

The farmer is by his position not in the condition to procure and command the efficacious elements necessary for the restoration and increase of the fertility of his fields in a right proportion and suitable form. For this purpose, science and industry must combine their aid.

I have been so fortunate as to remove the difficulties which are opposed to the application of a mere mixture of the elements of manure. If we employ the different elements of manure exactly in those proportions in which they are necessary according to experience, for a rich crop of wheat, peas, turnips, potatoes, &c., and if, at the same time, we leave them in their common state, they do not produce that effect which we might have expected. The cause of this is that the different elements of nature possess a very unequal stability; the ammonia evaporates, the soluble elements are carried off by the rain, and the effect is more in proportion with the amount of those ingredients of the manure which are less soluble.

I have found means to give every soluble ingredient of manure, by its combination with others, any degree of solubility, without altering its effect on vegetation. I give, for instance, the alkalies in such a state as not to be more soluble than gypsum, which, as is well known, acts through many years, even as long as a particle of it remains in the soil.

The mixture of the manures has been adapted to the mean quantity of rain in this country; the manure which is used in summer has a greater degree of solubility than that used in winter. Experience must lead to farther results, and in future the farmer will be able to calculate the amount of produce of his fields, if temperature, want of rain, &c., do not oppose the manures coming fairly into action.

I must, however, observe that the artificial manures in no way alter the mechanical condition of the fields; that they do not render a heavy soil more accessible to air and moisture. For such fields, the porous stable manure will always have its great value; it can be given together with the artificial manure.

Messrs. Muspratt and Co. have undertaken to execute my prescriptions on a large scale, and they are prepared to have ready a quantity of manure in autumn, for wheat, clover, &c., to satisfy the orders of the farmers. One of my former pupils, now Professor of Chemistry as applied to arts and manufactures, in this University, is to superintend the fabrication of these different manures. All necessary guarantees are therefore given as regards their composition.

To prepare for the coming autumn a sufficient quantity of manures, it is necessary that the orders be given at the earliest possible time. It would be very expedient in case that different kinds of soil are cultivated in a farm, to acquaint Messrs. Muspratt and Co. with the fact, as the proportions regarding silica are different for clayey and calcareous soils, to which latter, in order to render them fertile for grain, more of an easily dissolving silicate must be added.

All manure which is to be used during next winter contains a quantity of ammonia corresponding with the amount of nitrogen in the grain and crops which are to be grown. Experiments, in which I am at present engaged, will show whether in future times the cost of this manure can be greatly lessened by excluding half or the whole amount of ammonia. I believe that this can be accomplished for many plants, as for clover and all very foliaceous vegetables, and for peas and beans; but my trials are not so far advanced as to prove the fact with certainty.

(Signed) DR. JUSTUS LIEBIG.

Giessen University, 1845.

To Cure a Good Ham.—Take twelve hams of common size, eight pounds of brown sugar, crystallized saltpetre half a pound, and five pounds fine Liverpool salt. Rub the hams well with mixture, and lay them in a cask, with the skin down, where they should remain for a week. Then make a brine strong enough to bear an egg, add two or three quarts of ley from hickory ashes, and refine the whole by boiling and skimming. Cover your hams with the brine; let them remain three or four weeks; then hang them up in a smoke house, and smoke well with hickory wood.

Winter Herbs.—The best time for gathering herbs for winter use is when they are in blossom. If left till they are in seed, the strength goes to the seed. They are best picked from the stalks, dried quickly (but not burnt) before the fire, and rubbed into powder; then bottled.

Wash for the Mouth.—An excellent wash for the mouth is made of half an ounce of tincture of myrrh and two ounces of Peruvian bark. Keep in a phial for use. A few drops in a glass of water are sufficient.

NUTRITION IN VARIOUS GRAINS.

BY PROF. NORTON.

WHEAT is one of the most important of our crops. The grain contains from fifty to seventy per cent. of starch, from ten to twenty per cent. of gluten, and from three to five per cent. of fatty matter. The proportion of gluten is said to be the largest in the grain of quite warm countries.

It is a singular fact, that in all the seed of wheat and other grains, the principal part of the oil lies near or in the skin, as also does a large portion of the gluten. The bran owes to this much of its nutritive and fattening qualities. Thus in refining our flour to the utmost possible extent, we diminish somewhat its value for food. The phosphates of the ash also lie to a great degree in the skin. The best fine flour contains above seventy pounds of starch to each hundred. The residue of one hundred pounds consists of ten or twelve pounds of gluten, six to eight pounds of sugar and gum, and ten to fourteen pounds of water and a little oil.

Rye flour more nearly resembles wheaten flour in its composition than any other; it has, however, more of certain gummy and sugary substances, which make it tenacious, and also impart a sweetish taste. In baking all grains and roots which have much starch in them, a certain change takes place in their chemical composition. By baking, flour becomes more nutritious, and more easily digestible, because more soluble.

Barley contains rather less starch than wheat, also less sugar and gum. There is little gluten, but a substance somewhat like it, and containing about the same amount of nitrogen.

Oatmeal is little used as food in this country, but it is equal, if not superior in its nutritious qualities, to flour from any of the other grains; superior, I have no doubt, to most of the fine wheaten flour of the northern latitudes. It contains from ten to eighteen per cent. of a body having about the same amount of nitrogen as gluten. Besides this, there is a considerable quantity of sugar and gum, and from five to six per cent. of oil or fatty matter, which may be obtained in the form of a clear, fragrant liquid. Oatmeal, then, has not only abundance of substance containing nitrogen, but is also quite fattening. It is, in short, an excellent food for working animals, and, as has been abundantly proved in Scotland, for working men also.

Buckwheat is less nutritious than the other grains which we have noticed. Its flour has from six to ten per cent. of nitrogenous compounds, about fifty per cent. of starch, and from five to eight of sugar and gum. In speaking of buckwheat or of oats, we of course mean without husks.

Rice was formerly supposed to contain little nitrogen; but recent examinations have shown that there is a considerable portion, some six or eight per cent. of a substance like gluten. The percentage of fatty matter and of sugar is quite small, but that of starch much larger than any grain yet mentioned, being between eighty and ninety per cent., usually about eighty-two.

Indian corn contains about sixty per cent. of starch, nearly the same as oats. The proportion of oil and gum is large, about ten per cent.; this explains the fattening properties of Indian meal, so well known to practical men. There is, besides these, a good portion of sugar. The nitrogenous substances are also considerable in quantity, some twelve to sixteen per cent.

Sweet corn differs from all other varieties, containing only about eighteen per cent. of starch. The amount of sugar is, of course, very large, and the nitrogenous substance amounts to the very large proportion of twenty per

cent.; of gum to thirteen or fourteen; and of oil, to about eleven. This, from the above results, is one of the most nourishing crops grown. If it can be made to yield as much per acre as the harder varieties, it is well worth a trial on a large scale.

THE CORN TRADE OF EUROPE.

By the latest advices from England, we learn that the price of American flour, freight, duty, and all other charges paid, was about 18s. or $4.32 per barrel; and what was the prospect of improvement may be judged by our farmers after a perusal of the annexed report, which we take from the *London Gazette* of Sept. 11. We beg them now to recollect that the market for the products of the earth among the producers of coal, cloth, and iron, increased to the extent of more than *a hundred millions a year* under the tariff of 1842, and that it would have grown by this time to *two hundred millions;* whereas under the operation of the tariff of 1846, instead of increasing another hundred millions it has fallen off fifty millions, and all this great domestic market has been sacrificed with a view to obtain the market described in the following article—a market in which the best wheat, freight and duty paid, will command from 90 cents to a dollar a bushel! How long will it be before our farmers will learn that they are to be enriched by making a market on the land for the products of the land?

The harvest in England may now be considered as finished, for though some quantity of corn still remains out in mountainous and backward districts, the great bulk of the crops has been secured. The splendid weather with which we have been favored since our last, has enabled farmers in Scotland and the north of Ireland to make rapid progress with cutting and carrying, and all apprehension as to the result of the harvest has been set at rest; the tone of the corn trade will, therefore, now be less influenced by atmospherical changes. It is yet, perhaps, somewhat early to speak positively as to the general yield of the United Kingdom, but in respect to the quality of this year's growth of corn there can be no doubt. Wheat especially may be described as extraordinarily fine, and of very heavy weight; the average per bushel will probably range from 63 to 64 lbs., which circumstance is a guarantee as to the excellent condition in which the crop has been saved. Barley is not so universally well spoken of, and the samples will vary materially. Oats have given a good return, more particularly in Ireland, and beans and peas are generally fine in quality, and good in quantity. With regard to the main crop of potatoes, the accounts continue somewhat conflicting, but after a careful consideration of the information which has reached us from different quarters, we are inclined to think that, in the majority of cases in which the leaves and haulm have been attacked, the mischief has not extended to the root. The planting took place earlier this spring than usual, and the plant was well advanced towards maturity before the disorder exhibited itself, to which we are inclined to attribute the comparatively trifling nature of the mischief done. What has since transpired has tended to confirm and strengthen the opinion we ventured to express last week, viz.: that *the total produce of food grown in the British Islands in* 1851 *will prove larger than has been gathered in any preceding year for several seasons past.* This being our conviction, *we naturally anticipate low prices for agricultural produce,* as, in addition to an abundance of home-grown grain, considerable supplies from abroad must be calculated on. The free admission of foreign corn will, under the circumstances, be severely felt by our farmers, and we fear that the advantages which they would have derived from so bountiful a harvest will be counteracted by undue foreign competition. In the first instance, the imports

will be principally in the shape of flour from America, but before winter sets in we may reckon on large receipts of wheat from the continent of Europe, and *it would therefore be vain to expect better prices than those now current.* We are, however, disposed to believe that growers will not thresh very freely, the unusually fine quality and excellent condition of this year's produce being strong inducements to hold. Nearly all the new wheat hitherto brought forward at the provincial as well as the metropolitan markets has met a somewhat ready sale, the red at prices varying from 36s. to 38s., and the white at from 40s. to 45s. per quarter. These rates are so moderate that we can scarcely believe that any further decline of importance can take place. At Mark Lane on Monday, there was a good show of wheat by land carriage samples from Essex and Kent, with a few offers from Lincolnshire, Cambridgeshire, and that neighborhood. Nearly the entire supply was of this year's growth, and the millers agreeing to pay previous prices, the stands were cleared at an early hour. Since then the desire to purchase has apparently fallen off, but as there was not much fresh up, either on Wednesday or this morning, factors have refused to make any concession, and the business done has been on former terms. The arrivals from abroad, without being large, have proved amply sufficient to satisfy the demand. We rarely remember so complete a cessation of inquiry for old wheat at this period of the year; hardly any country purchasers visit our market, and the large town millers seem to be in no want of foreign wheat; the transactions have, consequently, been on quite a retail scale throughout the week, and though prices have not been quoted lower, the turn has certainly been in favor of the buyer. The late arrivals have consisted of good qualities from Dantzic, Rostock, &c., but they have met with little attention, and importers will, probably, have to incur landing expenses, or force sales, at even lower terms than those now current. In floating cargoes nothing of the slightest interest has occurred; the last sales reported to have been made of Polish Odessa wheat were at 31s. to 31s. 6d. per quarter, cost, freight, and insurrance. The bakers have not much flour on hand, and notwithstanding the depressed state of the wheat trade, the value of the manufactured article has been well supported. This may be partly accounted for by the smallness of the supplies of flour from France for some weeks past, and the diminished competition which our millers have consequently had to contend with. Hitherto little new barley has been threshed, and the quantity brought forward at Mark Lane has been so small this week that sellers have experienced no difficulty in obtaining former prices. Moderately good malting samples have realized 29s. to 30s., and really choice lots 1s. to 2s. per quarter more. The demand for foreign, suitable for grinding, has also been tolerably active; thin light qualities have sold at 22s. to 23s., and heavy samples at 24s. per quarter. In malt, there has not been much passing, and prices have undergone no change requiring notice. The arrivals of oats, coastwise and from Ireland, have been scanty; but we have again to report a large supply from abroad, principally from Archangel. It being, however, the prevailing opinion that the Russian supplies will soon fall off, factors have refrained from pressing sales, and though the trade has been far from lively, former terms have been maintained. The sales made on Monday were at rates precisely similar to those current on that day se'nnight, and neither on Wednesday nor this morning could good corn be bought cheaper than in the beginning of the week. Beans have come rather sparingly to hand, and have not been sold lower than before. Peas have rather crept up in value, but not so much as to render it necessary to alter quotations. We have heard of no sales of Indian corn.

THE VEGETABLE KINGDOM.

BY JOHN B. NEWMAN, M. D.,

[Popular Lecturer on the Institutes of Medicine.]

It was remarked by a philosopher, some years ago, that it was scarcely possible to tell the difference between a dog and a rose. This statement, to the greater number of my readers who have not reflected on the subject, will appear hardly probable. Anecdotes of the sagacity and faithfulness of dogs are known to all; and I doubt not many of them in our cities are possessed of more knowledge and practical information, and are better members of society, than the swarms of idle and vicious youth who crowd the streets. How then, with such facts before him, could Boret make such an assertion? I will tell you. Our ideas of the intelligence of animals are derived from the proofs of design we see them exhibit. Having a certain end in view, they will choose, with the most astonishing discrimination, out of a number of means, the ones best adapted to their purposes, and contrive to use these in such a way as to be almost uniformly successful. Natural history is made up of facts in support of this position. Our next inquiry will be to find out whether plants ever show such instances of choice and foresight; and a little examination will prove that most unquestionably they do.

Strawberries planted on moist grounds give out no runners; but, on placing them in a dry soil with water at some distance, we find runners travelling around until they discover it, and then remaining a living aqueduct to supply the plant. If these runners are moved round to the other side, they will soon regain their original position with unerring certainty. If you turn the under surface of a rose leaf upwards, it will in a little while commence a return movement, gently twisting with a kind of effort on its peduncle, as on a sort of pivot. The Abbé Marten transplanted a rose tree from one part of his garden to another for the purpose of experiment. To the right of the new position, the soil was hard, dry, and sterile; to the left, moist, rich, and tender. The roots at first radiated alike to the right and left. But he soon discovered that the roots which had advanced to the right bent backward toward the fertile and mellow earth, as if divining that their companions at the left had found better pasture. To prevent their intercepting nourishment intended for other plants, he dug a ditch to stop the further advancement of the roots. Arrived at the ditch, they plunged perpendicularly below its bottom, ran around, and advanced anew toward the point whence they had discovered the rich soil. Instances of their foresight in guarding against excessive heat, wind, and rain, are equally numerous. In France, the peasants train the carbine by their doors to serve as a barometer; its open flowers show clear weather, but closed, an abundance of rain. The shepherd's weather-glass has the same property; if it does not show its face to greet the sun on his ascension, the sheep remain in the fold on that day. The "four o'clock" opens its flowers regularly every afternoon at that hour, to show the laborer that if he cannot afford a watch, nature will provide him with the means of knowing the hour without expense. Such examples certainly prove a faculty of judging according to the sense of plants. And now the inquirer asks, what is the nature of this principle, and in what does it differ from chemical affinity or attraction? A perfect exemplification of this difference is given in the history of its creation. "And God made every plant of the field before it was in the earth, and every herb of the field before it grew." Dry land and seas by this

time were divided, and the forces of the inorganic world in full operation. These forces are called the pullers-down of nature. Exposed to their influence, mountain and hill crumble into dust; and it is owing to their agency that volcanoes and earthquakes destroy cities and swallow up nations. This is due probably to the shape of the ultimate atoms, which, fitting into each other in different ways, occasion perpetual change. But on the third day, a controlling influence, a new set of powers, the builders of nature, appear; created in kind and degree different from matter, yet only manifesting their presence to us in connection with it.

So far from allowing these atoms to unite according to their affinities, which would soon destroy nature, they exercise the most despotic sway, controlling them to the last. The chemical forces are in perfect subjection while life remains; but the moment it departs, and dust returns to dust, the work of destruction begins and the body vanishes into air. A beautiful example of this opposition is shown by seeds, which are the simplest independent forms of the union of the life-power with matter. Take two of these, and having destroyed the vitality of one of them by passing an electric spark through it, place both in warm and moist earth. The dead seed, surrounded by all the conditions favorable to its decomposition, is speedily resolved into its native elements, while the living one makes slaves of its enemies, rapidly sprouts up amid the surrounding desolation, and hangs out its flowery banners, as tokens of victory. Seeds retain life almost any length of time. I once noticed an account of an abundant harvest reaped from the growth of seeds found in an Egyptian mummy, over two thousand years old. A seed, finding itself in a warm, moist place, suddenly becomes aware that it has work to do, and sets about it without delay. The seed case bursts, a stalk and leaves appear above, while the root, sending off filaments, remains below. At the end of each of these little filaments is a spongiole, or bundle of leech-like mouths. These suck from the soil whatever they require, and then act the part of a stomach in instantly digesting it. A series of ascending vessels or veins are ready to carry it to the leaves to be further elaborated; when it arrives there its oxygen is given off, and a supply of carbonic acid obtained from the air is combined with it; and the pure blood or sap is carried by the arteries to every part to supply its necessities and form compounds.

Plants are manufacturing establishments: some make the essential oils, as the cinnamon, sassafras and rose; others salts, as the sorrel, oxalic acid; the bark-tree, quinine; and the willow, salaxy. Many a despised shrub has properties more deadly and dangerous than a powder-magazine; the laurel and peach yield prussic acid, one drop of which will destroy life; and travellers tell us that the atmosphere of the Upas is fatal for miles around it.

The vital principle of each plant being separate and independent in itself, explains the reason why two of them, the one a virulent poison, the other a table vegetable, will grow side by side, and draw their nourishment from the same source. It also shows the error of our modern agriculturists, who treat these living existences endowed with a power of choice and foresight as if they were tubes imbibing whatever was placed near them by capillary attraction.

Man resembles a torch, in requiring oxygen to keep him burning or alive; in return for this he throws out carbonic acid, which is to him a virulent poison. Now what prevents this gas accumulating in the air and destroying the animal kingdom? And from what source shall the supply of oxygen be derived to answer our continual demand? Only from the respiration of plants; which we can now see not only supply us with food, but are absolutely necessary for our daily existence.

When the Custom House and Merchant's Exchange were erecting in New-York, they were the daily resort of thousands who flocked to witness their gradual progress; yet how much more wonderful is the building of a vegetable palace! Unseen workmen are urging it forward with untiring industry; column after column forms; story after story rises; staircase and hall and gallery are soon fixed in their positions. We think it a great thing to have the Croton water brought into our houses; yet in every one of these little chambers, there are pipes to carry food and water and take away the residue. It is made of the finest material, elastic, capable of bending to the breeze, and, to defend it from the rain, covered either with water-proof varnish, or stuccoed over with the rarest porcelain. And all this time the spectator is not disturbed by noise or dust, the greater part of the work being carried on under ground. When all is completed, no monarch on earth could obtain such a residence. The very paint of its walls, though exposed to all kinds of impurity, is of such quality that the king's stateliest robes cannot match it. "Consider the lilies of the field: they toil not, neither do they spin; yet Solomon in all his glory was not arrayed like one of these." Nay, they are even glad to obtain its essences at second hand, to perfume themselves.

The name of the inhabitant who owns the house is written on a broad door-plate of surpassing beauty, so that we can tell one from another. Books have been written on the language of these door-plates, or flowers, and it is said that angels by their means write mysterious truths on hill and field. The poet from the earliest ages has held the most sweet and loving converse with them. But to the physician, the priest of nature, they speak in a higher and more exalted strain. In them he reads the success of his mission. By their means he can conquer the most obstinate diseases. As nothing has ever been formed for show alone, the truly useful will always be the truly beautiful. When the uses are perfectly understood, the fond dream of the Rosicrucian shall not want verification. The bone shall continue firm and the muscle strong; the eye of youth retain its lustre; and as century after century passes away, the lapse of time shall but witness our triumph over the pullers-down of nature, and our increase in wisdom and love. The happy children of Flora, that have retained undimmed the influence of their Creator's smile when first he pronounced his work good in Eden, shall receive added radiance and more dazzling glory, as they again behold His face in the dawning morn of the Millennium.

Teeth Set on Edge.—All acid foods, drinks, medicines, and tooth washes and powders, are very injurious to the teeth. If a tooth is put in cider, vinegar, lemon juice, or tartaric acid, in a few hours the enamel will be completely destroyed, so that it can be removed by the finger nail as if it were chalk. Most have experienced what is commonly called teeth set on edge. The explanation of it is, the acid of the fruit that has been eaten has so softened the enamel of the tooth that the least pressure is felt by the exceedingly small nerves which pervade the thin membrane which connects the enamel and the bony part of the tooth. Such an effect cannot be produced without injuring the enamel. True, it will become hard again, when the acid has been removed by the fluids of the mouth, just as an egg shell that has been softened in this way becomes hard again by being put in the water. When the effect of sour fruit on the teeth subsides, they feel as well as ever, but they are not as well. And the oftener it is repeated, the sooner the disastrous consequences are manifested.

ABSURDITIES AND THEIR AUTHORS.

"It is nonsense to say, with the *Evening Journal*, that where we import the value of ten thousand barrels of flour which we have sent abroad, we bring the ten thousand barrels back again. But the defense of the protective system leads people to all manner of absurdities."

Such is the answer that the New-York *Evening Post* offers to what it styles a gastronomic view of the tariff. The *Post* is a witty paper, and relies upon the effect of its humor much more than upon sober argument. But the power of fun depends very much upon whom it is poked at. Let us see then who it is that is responsible for the absurdity of the *Evening Journal*. The first numskull who suggested the idea is a gentleman in a big wig and enormous pair of spectacles, whose bust for many years stood over the door of the *Evening Post* printing office. He was thought to be rather a sensible man in his day, but that was a good while ago. His name was BENJAMIN FRANKLIN. On the fourth day f April, 1769, that absurd old noodle wrote as follows:—

"*Manufactures* are only *another shape* into which so much provisions and subsistence are turned as were equal in value to the manufactures produced. This appears from hence, that the manufacturer does not, in fact, obtain from the employer for his labor *more* than a mere subsistence, including raiment, fuel, and shelter, all of which derive their value from the provisions consumed in procuring them."

In the same paper he says: "The advantage of manufactures is, that under their shape provisions may be more easily carried to a foreign market."

This Benjamin Franklin was in the habit of corresponding with a man in Scotland, who afterwards wrote a book, and made himself quite notorious. The *Evening Post* has a thousand times mentioned him as the person who utterly exploded the absurdities of the protective system. His name was ADAM SMITH, and the title of his book is the "Wealth of Nations." He got from Franklin the absurd notion that manufactures are only food in another shape, and taught it to others in these words:—

"A piece of fine cloth which weighs only eighty pounds, contains in it the price not only of eighty pounds of wool, but sometimes of several thousand weight of corn, the maintenance of the different working people and their immediate employers. The corn, which could with difficulty have been carried abroad in its own shape, is in this manner virtually *exported in that of the complete manufacture*, and may easily be sent to the remotest corners of the world."

The difference between Adam Smith and those who, like the *Evening Post*, deny his principles, while stealing his name, is, that Smith thinks it best to export what may be "easily sent," while they want our farmers to content themselves with raising what can only "with difficulty be carried abroad."

But when we come down to modern times, we find men who have fallen into the same absurdity, and yet stand high in the esteem of the *Post*, as sound teachers of the philosophy of national wealth. Thus, WILLIAM BROWN, Esq., a free-trade member of the British Parliament from Lancaster, whose strictures on Mr. Meredith's Report the *Evening Post* has highly commended, said in one of his speeches that "Great Britian is the largest grain-exporting country in the world," because she sends abroad her grain "boiled down" (to use the phrase of another free-trade writer) into calico, and broadcloth, and cutlery.

Mr. KETTELL, who edits the *Democratic Review*, and is a regular contributor

of free-trade articles to the *Washington Union* and other papers, is infatuated with the same wild ideas. He says :—

"What a strange absurdity it is to see silk going from China and France, cotton from the Southern United States, wool from Australia, coffee and sugar from Brazil, wheat from New-York, Michigan, Odessa, and Poland, hemp and flax from St. Petersburg, pork and lard from Ohio and Illinois, concentrating in Lancashire, to be *returned in goods to the localities whence they came.*"

We hope the *Evening Post* will have the grace to apologize to Messrs. Brown and Kettell, for brethren ought not to fall out. As for Benjamin Franklin and Adam Smith, they are dead, but their surviving friends will deem it an ample atonement if the *Evening Post* will not hereafter pretend to be of their company.—*Rochester Democrat.*

URINE AS A FERTILIZER.

"A Practical Farmer," in the *Germantown Telegraph*, says, that the very high degree of value that urine possesses ought to recommend it to every one. Of the fertilizing effects of urine in a putrid or semi-putrid state, experience has supplied us with the most distinct and positive proof. In this condition, the alimentary properties with which it is endowed must all result exclusively from the amount of salts it contains. Besides these, it also contains a considerable amount of organic nitrogenous parts, which, by decomposition, produce the formation of ammonia, which is the source of the "nitrogenous proximate constituents of plants." The question has been frequently propounded, "whether we are to ascribe the known value of urine as a manure to its nitrogenous constituents, or solely and exclusively to its amount of salts, and, therefore, to its phosphates?" This inquiry may be one of interest to the speculatist and the philosopher, but for the more practical farmer it is enough that the evidences of its fertilizing effects are obvious and incontrovertible. If it will confer fertility upon the soil, and realize the great object of all experimental cultivation—causing "two blades of grass to grow where but one grew before,"—the object of the culturist will be accomplished, and the question as to the origin of its fertilizing energies may be left to the chemist and philosopher to decide.

In the summer of 1842, I applied to twenty hills of Indian corn, when just starting from the soil, one gallon of putrid urine per hill. After the first hoeing another gallon was applied, and after the second a third. This corn was planted on a thin, poor soil, which had been emasculated by long and severe cropping, and had become so far exhausted of humus as not to produce even a fair crop of indigenous weeds. The growth of the corn was rapid and luxuriant. No other stimulus was applied, and two hoeings were all that I allowed. On a patch of cucumbers, melons and squashes, I also applied the same with similar success. One great advantage attending the use of this liquid as a fertilizer is, it does not promote the growth of weeds. Solid excrement, and most, if not all the compounded fertilizers, contain innumerable seeds which take early root, and by gaining so much upon the more tardy cultivated crops, greatly perplex the farmer; but urine is free from this evil. It will, it is true, invigorate equally with the cultivated plant all such spurious productions as may have previously taken root, but its application will never foul the soil, if pure before it is applied. For irrigating grass land, it is probably the most energetic, fructifying and salutary agent known.

In its perfectly fresh state, urine does not act so energetically, and is rather

harmful than otherwise to most species of vegetation. I have applied it in this condition, and have never witnessed any good from it on any crop. Putrefaction is indispensable to give to it those highly fructifying properties which, in this state, it is so well known to possess. Petzholdt, in his "*Agricultural Chemistry*," explains the *rationale* of this, in the following manner:

"Now," says he, "if you consider that during the putrefaction of urine, its nitrogenous compounds, such as urea and uric acid, are transformed into carbonate of ammonia, a volatile substance, which escapes into the air, it will be seen that, unless it is applied before the process has become too far advanced, the principal fertilizing constituents will be lost, for it is to these that its efficacy as a stimulus of vegetable life principally belongs."

When circumstances render it necessary to preserve this liquid for a length of time on hand, before applying it, it is a good plan to mix gypsum with it, to attract and fix this fertilizing but volatile constituent. The urine of cattle should be conducted by a system of spouts or tubes to the manure heap, or to deposits of muck, loam, or some other absorbent substance, which will take it up and retain it, by the assistance of gypsum, or some other "fixer," till wanted for the benefit of the crops. That urine contains a large amount of animal matter, may be proved by the fact, that, of all the solid portions of the human system, there is a complete exhaustion and renewal once in every seven years. That is, to be more definite, the man, woman or child of to-day, has not in his physical structure one particle which constituted his frame seven years ago. The old, worn and abraded particles, as they become useless and detached, are passed from the constantly renovating organism, and are mostly to be found in the urine. These constitute a very fertilizing agent, and to them, principally, are we to refer the surprising results which attend the application of this substance as a manure, or stimulus of vegetable life. As to its effects when used for irrigating grass lands, allow me to present the following extract from an English work:

"From a meadow, which had not been manured, 8,000 lbs. of hay were obtained. The same surface, after irrigation with urine, yielded 11,432 lbs. of hay; that is, 3,432 lbs. more. In this country, equally beneficial results have followed the application, and in one or two instances the increase of product considerably exceeded that above given. To every one, therefore, I say—economize your liquid manures: it is an article far too valuable to be overlooked or lost."

FRUITS OF THE TARIFF OF 1846.

We see in the last Clarion *Register* a very beautiful commentary on the free-trade tariff of 1846. It is to be found in the advertisement of "John Klingelsmith, Sheriff," and successor of Seth Clover, of no less than *six furnaces*, ALL advertised to be sold at the "court-house in the borough of Clarion, on Monday, the 1st day of September next." We do not know the years in which Seth Clover was sheriff, or how many *he* may have brought to the hammer. We only know that he and his party have brought them all. We know that up to 1842 a good many were in existence; that from 1842 to 1846 a great number of new ones were built, and not one sold by the sheriff; that during this time they went on prospering and to prosper; that from this last date not one new one has been built; and that now, at every term of the County Court, they are advertised for sale by the half-dozen, as property no longer in request or of value sufficient to support themselves or owners.—*Pittsburg American.*

Flour now sells in New-York at less than four dollars a barrel. Chicago spring wheat

sold there but recently at sixty cents a bushel. Why is this? Why is it that prices are gradually settling down to a point lower than any we have seen for many years, and likely to touch a point lower than any we have ever yet seen? If our readers desire an answer to this question, they may, we think, find the true one in the paragraph above given. The rolling-mills of the country are nearly all closed. Furnaces that made in 1847 four hundred thousand tons of iron, worth in the various forms of stoves, axes, nails, railroad iron, &c., &c., *at least forty millions of dollars*, and making a market for that amount of the raw products of the earth, are already closed, and each day adds to the number. Ships, we were told, were more productive than furnaces, or cotton and woollen mills, but from the following paragraph, which we give on high free-trade authority, it would seem that the inducement to expend capital in ships is but little greater than to invest it in mills and furnaces:—

THE SHIP-YARDS.

The present appearance of most of the ship-yards of this city could not fail to arrest the attention of any one who had not visited them since the spring. The large yards located between Stanton and Twelfth streets have now not more than one third of the number of vessels in hand they had at the commencement of the year. Large spaces of ground which were then covered by huge frames of splendid ships, swarming with workmen, like bees clinging round a hive, have now a bare and desolate look. The impetus given to this branch of industry by the demand for vessels for the California business having somewhat subsided, *together with the low rates of freight which have prevailed for some time back*, have caused the falling off in the business of the ship-yards.—*New-York Herald.*

We are gradually closing the mills and furnaces of the Union, and with each step in that direction there is, and must continue to be, a diminished necessity for ships; a truth that will at some time become obvious to those who are yet disciples of British free trade. The Harmony of Interests between Agriculture, Manufactures, and Commerce is so perfect that one cannot profit without profit to all, nor can one of them suffer without injury to all. When will our political economists open their eyes to this great truth? When will our farmers awake to the fact that a great external trade cannot exist without a great internal one, and that the larger the latter the larger *must be* the former? We are now destroying the internal trade in hopes to build up the foreign one, and the result must be failure.

SMOKE-HOUSES.

Many persons commit great errors in building smoke-houses. To be nice, and be a handsome and respectable appurtenance to a farm, it must, forsooth, be built of brick or stone, with close-fitting doors, and a single aperture for the egress of the smoke. The consequence is, the meat is black and bitter, and might as well have been put in a pickle of pyroligneous acid; having lost all its fine flavor, smelling of soot like a chimney-sweep. The walls are so close and cold, that the smoke condenses and settles on the hams or bacon; and instead of drying, it becomes flabby and ill-colored.

A smoke-house can hardly be too open. It takes longer, to be sure, to perfect the process; but when completed, the meat is dry, of a fine, chestnut color, and a delicate flavor of smoke penetrating the whole mass.

The best houses we have seen are built with a stone wall three feet high, flagged bottom, and a wooden structure built on top of the wall. Common siding is tight enough, or boards endwise, like boarding a barn, is sufficient, with a tight board or shingle roof. The bottom is used for an ash-house, and the smoke fire is built on the ashes. It is safe for both purposes, and will

produce a much finer article for those who have a sweet tooth for that delicious treat—a nice-flavored ham.—*Guernsey Times.*

WHAT IS TO BE DONE WITH THE SURPLUS WHEAT OF THE UNITED STATES?

THE European markets give us no encouragement for shipments to any extent there, and if England should require a few millions of bushels, we have got to compete with several grain-growing governments in that market. Flour in Liverpool, at the latest advices, was twenty shillings, or four dollars and fifty cents.

Let us cipher and see the prospect of Michigan sending any of her surplus there to pay for the immense quantities of English goods we are consuming:

Flour per bbl., at Detroit,	$3 81
Wharfage,	0 03
Freight to Buffalo,	0 15
Wharfage and cartage to canal,	0 06
Buffalo to New-York,	0 75
Wharfage and cartage at New York,	0 06
New-York to Liverpool,	0 40
Commissions, insurances, wharfage, &c., at Liverpool,	0 50
Total,	$5 25
Worth in Liverpool,	$4 50

Here is evidence that nobody will go into that business. What, then, is to be done? We know of but one way. We must extend the home market. How can that be accomplished? Let Congress revise the present tariff, protect American industry, raise the duties on foreign manufactures, and save the eighty millions of dollars balance that is actually accruing against us, which goes to a people we do not feed. Then you will see manufacturing establishments of every kind fitting up—those already in operation making additions, and thousands of families who are now growing what they use will become consumers of your breadstuffs. That's the way to get good prices and make every section of the country flourishing.—*Detroit Tribune.*

AMERICAN SCIENCE.

AMERICAN science has already acquired a name that is respected throughout the civilized world. It has given man the four most precious boons he has received for two centuries—the cotton gin, the steamboat, the electric telegraph, and chloroform. No European researches into the laws of winds and storms have been attended with half the success that has marked the labors of Maury, and Espy, and Redfield. Our Nautical Almanac, especially that part of it relating to longitudes, founded upon the tabular formula of Mr. Longstreth, a merchant of Philadelphia, by unequalled exactitude has excited the astonishment of the scientific men of Europe. The new method of recording right ascensions and declinations, discovered by Prof. Mitchel, of Cincinnati, is of the utmost value to astronomical science; its permanent adoption at Greenwich is the best of all testimonials to its worth. Our country indeed need not be ashamed of her position in the scientific world while she is honored with such names as those that adorned the long roll of the Albany meeting last week—Agassiz, Pierce, Henry, Mitchel, Baché, Maury, Olmsted, Hitchcock, Horsford, Hare, Rogers, Loomis, Wilkes, Hall, and scores of others in whose fame every intelligent American will feel a just pride.

Editorial.

RENOVATING LAWNS.

We have received a communication from a correspondent on this subject, which, however, is simply in general terms, and not sufficiently definite to enable us satisfactorily to answer his query. He desires information in regard to the "best method of renovating lawns," and proposes to turn in sheep on his for that purpose. Now, in order to make such suggestions as would be most conducive to his benefit, it would be necessary to be informed what is its situation; what the nature of the soil; how long the surface has been undisturbed; what has been its former treatment; its size, locality, etc., etc. But without a knowledge of these somewhat important particulars, we will venture a few hints of general application.

In the first place, if the soil is moist clay, or loam, a generous top-dressing of fine stable manure or compost should be employed, and, if necessary, repeated the following season. The month of March would be the best time for doing this. Should the soil be of a light gravelly nature, abounding in silex, either dry or leached wood-ashes applied liberally to the surface would be an excellent fertilizer, and bring forward an abundant and beautiful covering of small white clover, (trefoil,) a most fragrant and delightful production for lawn purposes.

If the soil has become "sod," or "sward-bound," a toothed roller would be of essential service in its renovation. An occasional watering (if not too extensive) from a garden engine, with a solution of guano, would doubtless prove beneficial to lawns which have become sterile. The plan of turning sheep on a lawn may not be a bad one, but great care should be observed that they do not injure the young shoots and tender buds of the shrubbery, which they are sometimes inclined to do; and we should prefer to dispense with their service, unless, by long neglect, coarse wild grasses, running briers, etc., might have made their appearance. In the latter case sheep would be a benefit, as they frequently eat them with avidity when young. A top-dressing of well decomposed muck, on which sheep have been hurdled, is an excellent renovator for lawns having a light, sandy soil.

PORTRAIT AND BIOGRAPHY OF HENRY C. CAREY, Esq.

The following is an extract from a letter received at this office, containing five new subscribers for *The Plough, the Loom, and the Anvil*, with ten dollars, dated

"Clinton, Miss., August 25, 1851.

"I would like much for you to send the 'Harmony of Interests' to the first-named gentleman. Four of us are anti-tariff Democrats, and I among them; but I have become convinced, by reading Mr. Carey's 'Harmony of Interests,' that the doctrine contended for by him, to wit, *perfect protection against the pauper labor of England*, is the true doctrine, and its adoption indispensable to our prosperity as an agricultural and a planting community.

"I consider Mr. Henry C. Carey as one of the clearest and ablest writers of the day. Upon the subject of protection, his writings are calculated to exert a much greater influence than those of any other man in the nation, Mr. Clay and Mr. Webster not excepted. Mr. Carey has become so interesting a character to many of your subscribers, that a short biography of him would be exceedingly gratifying to them. I have frequently been asked who Mr. Carey was.

"Though not a subscriber, I have been a constant reader of your journal for twelve

months, and intend to be through life. It is to be hoped that Mr. Carey will continue his contributions.

"Yours respectfully, ———."

In accordance with the wish expressed in the foregoing letter, we shall embellish the January number of *The Plough, the Loom, and the Anvil* with a beautifully engraved Portrait, accompanied with a biographical sketch, of Mr. Carey. We are happy to be able to assure the writer, as well as all our readers, that Mr. Carey's contributions will continue to enrich our pages.

PENNSYLVANIA HORTICULTURAL SOCIETY.

The annual exhibition of this Society commenced on the 17th of September, and closed on the 19th. Taking the exhibition altogether, it was a very good one; much better than could have been expected on account of the very dry season. The floricultural department was not as full or as rich in display as usual, but some of the fruits, particularly the pears and apples, were much more so. The prominent feature of the exhibition was the "*Victoria Regia*," deposited by Caleb Cope, Esq., of Philadelphia. We believe it is the first of the kind brought into this country. It is a species of water-lily, and the leaf when expanded measures six feet in diameter. The flower, when fully blown, measures about twelve inches, and is certainly as curious as it is beautiful. The vegetables were uncommonly fine, and there were a great many of them. On the whole, the display was very good, and the exhibition reflects great credit on the gentlemanly managers.

THE ROCHESTER FAIR.

The New-York State Agricultural Fair, which was held last month at Rochester, appears to have been one of the most successful they have ever had. The city was completely crowded with strangers, including some of the most distinguished men, and the exhibition, which covered some 29 acres of ground, was highly creditable in every department. This Fair is said to have produced some $3,000 more receipts than any that have preceded it. The receipts from admission were $14,000, while the premiums amounted to about $5,000. The Annual Address was delivered by the Hon. S. A. Douglas, who discussed at much length the importance of Agriculture, and its influence upon the growth of our country, its tendency to develop the mind and body of the people. He noticed the leading crops, such as cotton, tobacco, breadstuffs, sugar, rice, silk, wine, woollen, &c. He alluded also to our mineral resources, and suggested the propriety of establishing a great National Agricultural Society, to collect information from the different States, and diffuse it among the people in an annual report, thus presenting a view of the agricultural condition of our whole country. Judge Douglas' address smacked strongly of free trade; aside from which it was a very interesting and highly finished production.

"Comstocking."—This is a term applied to a system of agriculture, horticulture, fruit-growing, &c. &c., practised by Russell Comstock, Esq., of Mabbettsville, Dutchess county, New-York, of which he claims to be the discoverer, and a knowledge of which he imparts in lectures for a remuneration, relying upon the good faith of his auditors not to repeat the information thus given to others. The *Fishkill Standard* says that "the lectures are acknowledged to be of vast importance, and well deserving of a liberal patronage." We know nothing *practically* of Mr. Comstock's system, and do not wish to be understood as speaking of it either approvingly or disparagingly.

Rust in Wheat.—A correspondent of the Boston *Cultivator*, speaking of wheat rust, gives the following as the result of his experience: "The rust or mildew on wheat is

caused by a slight drought and a sudden rain, and the sun coming out hot immediately after, without wind, when the wheat-berry is about two thirds full, when it gives the wheat such an impetus, that it splits the stalk of the grain, which causes the sap to ooze out, and finally stops the growth of the berry. After this takes place, any person will notice that the spots on the stalk are all lengthways of the stalk, and by taking a sharp knife, he will find that the stalk is split open. Now the grain must be about two thirds full to have this take place, and at no other stage of its growth. We believe that manuring with new unrotted manure will increase the evil, because it begins to work when the grain needs it the least, in the hot, sultry weather of July and August."

To Keep Preserves.—Fill your jars to within an inch of the top, and with strong tissue or other paper, or muslin dipped in a solution of gum arabic, isinglass, or the white of an egg, cover the jars, overlapping the edges an inch or more, and pressing the paper or muslin closely over and around the mouth of each. No tying is required, and when dry, the whole will become perfectly smooth and tight, and being impervious to air, will preserve the contents better than many methods less simple.

Sponge made into Broadcloth.—A Key West letter estimates the value of the sponge, which has been or will be gathered in that vicinity this season, at $50,000, and says that some French manufacturers are using this article for making their finest broadcloths. It is either mixed with wool or with cotton. At any rate, the cloth made from it is very beautiful; its lustre is unsurpassed by the finest Saxony, and it has the strength of linen.

Cordage from the Aloe.—The editor of a St. Augustine paper in a recent number says: "We have been shown a beautiful specimen of a fishing line made from the fibres of the so-called century plant, which abounds here. It has the smoothness and lustre of silk, and great strength, and is well adapted for cordage of every description. The plant is grown upon the poorest soils, and attains an immense size. The subject of introducing its cultivation for cordage is well worth attention."

PERIODICALS, PAMPHLETS, &c.

The Illustrated Testament. By Rev. Ingram Cobbin.

Any means by which the Divine Word may be rendered more attractive, and at the same time elucidate its meaning, particularly in regard to the young, cannot but be of great importance and benefit to the community. And while we have noticed repeated editions of the Illustrated Bible of Mr. Cobbin, the New Testament, in a cheap octavo form, has, we believe, never before been published in this country. It is intended for Youth and Schools, and is admirably calculated for the designed purpose, being very neatly embellished with numerous wood cuts, together with descriptive and illustrative notes and explanations. The first number has just been issued by Messrs. Mead & Sewell, 123 Fulton street, New-York, and the work will be continued through the series in twelve monthly parts, which will complete it. Price $1 for the volume, or 10 cents per number.

The Family Circle and Parlor Annual, by J. G. Reed, 140 Fulton street, New-York, has just commenced its twelfth volume, greatly improved in matter and embel-

lishments. The publisher offers a premium of a large and beautiful engraving of WASHINGTON to all subscribers who pay a year in advance. Terms, $1 per annum.

THE CHRISTIAN PARLOR MAGAZINE, by Geo. Pratt, 116 Nassau street, New-York, ranks high as a literary work, beside the moral influence which pervades all of its pages It is issued monthly, in the style of the best magazines of the day, and is richly embellished. Price $2 per annum, in advance.

THE INTERNATIONAL MAGAZINE, by Stringer & Townsend, and HARPER'S MONTHLY, by the distinguished house of Harper & Brothers, both of New-York, are prodigies for cheapness, when we regard the quantity of reading matter which they contain. The character of these works is so well and favorably known, that any commendation from us would seem superfluous.

THE KNICKERBOCKER MAGAZINE, by Samuel Hueston, 139 Nassau street, New-York, is a monthly repository of all that is good-natured and humorous, while it is the oldest and most refined in its literary character of any of its contemporaries. It can date its existence back far enough to be the great grandfather of the numerous "small fry" with which it is surrounded; and we are glad to learn that in its green old age it gives a rich yield to the consumer as well as to him who cultivates its soil.

MISCELLANEOUS SUMMARY.

THE *Pittsburg American* is complaining that the iron trade is very much depressed; half the mills in that city being idle. No wonder, when our Government allows the English to send their iron here and undersell us. . . . THE *Montreal Gazette* mentions that the flag of England was publicly burnt on the public square in that city when news was received that the Queen had signed the Ecclesiastical Titles bill. . . . HE who does not prevent a wrong when it is in his power, is equally criminal with him who commits it, and will be esteemed accordingly. . . . MR. HENRY E. BABCOCK, of Somers, Connecticut, recently killed a hen which was found to contain eleven full-sized eggs. . . . THE coffee crop is immense; never exceeded. A decline of 20 per cent. has taken place in the West Indies. . . . THE amount of contributions to the Washington National Monument during the month of August amounted in the aggregate to $2,401 31. . . . MACKINAW trout are for sale in Albany. It is the first time they have ever been offered in that market. . . . TEMPERANCE puts wood on the fire, flour in the barrel, meat in the larder, vigor in the body, intelligence in the brain, and happiness in the whole family. . . . MR. HOSEA BARNES, living near Havre de Grace, Md., raised on nearly an acre and a half of ground sixty bushels of wheat, weighing sixty-four pounds to the bushel, on stock ground. . . . THE farm belonging to the late John Ash, lying two miles from Elkton, Md., was recently sold for $3,355, being $30 50 per acre. . . . CHERISH the tender buds of pity, and they will bloom with benevolence. . . . M. S. PLUMMER, Esq., of Prince George's county, Md., raised this season 5,300 bushels of wheat. . . . FIVE horses were stolen from Petersville, Frederick county, and its vicinity, a few nights ago. . . . FOURTEEN hogsheads of gooseberries were entered at the Boston Custom-House recently, imported in the ship Hamilton from London. . . . JUDGE LEVI WOODBURY died at Portsmouth, N. H., on the 4th Sept., aged 61 years. . . . A CANADIAN schooner cleared lately from Chicago for St. John's, Newfoundland, with a cargo worth about $7,200, mostly of corn. . . . ONE of the New-York hotels receives from $1,000 to $1,200 per day

above its expenses. . . . To pickle nasturtiums: soak them three days in salt and water, as you collect them, changing it once in three days, and when you have enough, pour off the brine and pour on scalding vinegar. . . . Do not keep pickles in common earthenware, as the glazing contains lead, and combines with the vinegar. . . . A FARMER in Preble county, O., this season raised 63 bushels of flax-seed on 3 acres and 10 rods of ground—being over 22½ bushels to the acre. . . . AT the present time upward of $300,000,000 are invested in the various railways of the United States. . . . IN walking, always turn your toes out, and your thoughts inward. The former will prevent you from falling into cellars, the latter from falling into iniquity. . . . THE average number of persons ascending Bunker-Hill Monument is stated at 18,000 a year, and 12½ cents admission is charged, giving an annual income of about $20,000. . . . BY the appeal of the shirt sewers of New-York to the public, it appears there are upwards of 6,000 of them, whose average wages are only from $2 to $2 50 per week. . . . IN the 23,000,000 of the United States population are more persons who habitually read and write than can be found in 150,000,000 in Europe in one area marked off in any shape you please. . . . THE *Cincinnati Inquirer* states that the stock of barrelled pork on hand at present is not more than one fifth the amount on hand last season at the same time of year. . . . VINEGAR for pickling should be sharp, though not the sharpest kind, as it injures the pickles. If you use copper, bell metal, or brass vessels for pickling, never allow the vinegar to cool in them, as it then is poisonous. . . . LEAD ore of a very fine quality has been discovered in Delaware county, N. Y.; it is found at the base of a mountain five hundred feet high, which is said to contain also coal and iron. . . . HUMILITY is a grace that adorns and beautifies every other grace; without it, the most splendid natural and acquired acquisitions lose half their charm. . . . THE *Opelousas* (La.) *Whig* states that some of the hands of Mr. Lutz of that place, while digging on his plantation, found a large quantity of gold coin, amounting to about $14,000. . . . VALUABLE mineral springs have been discovered at Alligator, Fla. The temperature of the water is sixty-seven degrees Fahrenheit, and is strongly impregnated with sulphur, nitre, and iron. . . . A MASSIVE gold medal, of two hundred dollars value, has been prepared at San Francisco for presentation to the New-England Guards of the city of Boston. . . . DR. ACKLEY, of the Cleveland Medical College, has a wild cat three months old, a fine specimen of the animal, which was caught when a "wee thing," and brought up under the immediate supervision of a domestic cat. . . . PERSONS who are always cheerful and good-humored are very useful in the world; they maintain peace and happiness, and spread a thankful temper amongst all who live around them. . . . THE receipts for tickets at the Mechanics' Fair in Providence, R. I., were $900 the first day and $1,800 the second. . . . THE best cane seats for chairs are said to be manufactured by prisoners in the New-Jersey State Prison. . . . A MOST disastrous storm has swept over Lower Georgia, which has proved very destructive to buildings and the crops. . . . PROFESSOR AGASSIZ has been engaged to deliver annually a course of lectures before the Medical School in Charleston, S. C. . . . A WOMAN has been committed for trial in London for going into a jeweller's shop in Shoreditch and throwing a quantity of white pepper into the eyes of the shopman, while she ran off with a card containing forty-one wedding-rings. . . . AT the Philadelphia Journeymen Printers' Celebration, the following toast was given:—Hoe's Last Fast Press; the only six-barrelled revolver whose *discharges* spread enlightenment throughout the *army* of intellect. . . . THERE are few dinners served in England, even among the aristocracy, that are not timed by a Connecticut clock upon the kitchen shelf. . . . THE citizens of Danvers, Mass., have in contemplation an appropriate celebration of the one hundredth anniversary of the severance of that town from Salem, which event occurred Jan. 29, 1752. . . . THE Susquehanna is so low that boats cannot be had to load for Havre de Grace or Baltimore, not being able to enter a tide-water canal. . . . OUR worst enemies are those

which we carry with us in our hearts. They are the evil passions; and he who can get the victory over them is the greatest of earthly conquerors. . . . Recently seventy Hungarian exiles, on their way West, were promptly passed over the railroads from Albany to Buffalo free. . . . Of the 106 persons deceased in the city of Providence, R. I., during the month of August, two were widows, three widowers, seven married persons, and ninety-five single. Matrimony in Rhode Island seems to be quite a healthful institution. . . . The Executive Committee of the Pennsylvania State Agricultural Society have changed the time of holding the agricultural fair to Wednesday Thursday, and Friday, the 29th, 30th, and 31st of October. . . . In Hooksett, N. H. forty rattlesnakes were recently killed by workmen blasting rocks on the line of the Portsmouth and Concord railroad. . . . For the Wilmington and Manchester railroad a purchase of 7,000 tons Welsh iron has been made. . . . During the year 1850, there were 53 steamboats lost upon the western waters, and 117 serious accidents occurred, as follows:—33 boats sunk; 14 burned; 6 destroyed by explosion; 64 seriously injured; over seven hundred persons lost their lives, and property to the amount of $1,500,000 was sacrificed. . . . The celebrated Neapolitan astronomer, Signor de Gasparis, has discovered another planet, being the fifth we owe to his successful exertions. . . . The *New-York Sun* states that the wife of Lopez is in Paris, and that he has a son 18 years of age studying in Switzerland. . . . To pickle tomatoes: as you gather them throw them into cold vinegar; when you have enough, take them out, and scald some spices tied in a bag in good vinegar, and pour hot over them. . . . A tailor of Gotha, Germany, has invented, with the assistance of a chemist, a new process by which clothes are made without sewing, the pieces being joined by a species of glue or paste. . . . Several fruit trees, inoculated with the poison of the rattlesnake, at Albany, were poisoned by the virus, so that the leaves wilted and died. The trees recovered in time. . . . Mercantile credit, like female reputation, is sullied by a breath. . . . Powers's statue of Eve, which was lost with the Swedish ship Westmoreland, off Cape Palos, on the 3d of May, 1850, has been recovered, and is now in New-York. . . . The London correspondent of the *Post* states that the great medal on agricultural implements, given only where a new practical principle had been applied successfully in an implement for agricultural purposes, has been conferred upon Mr. McCormick, of Chicago, for his grain reaper. . . . Since the triumph of the Yankees in steaming and sailing, Yankee-doodle-doo should be changed, in England, to Yankee-doodle-did. . . . Benj. Hallowell, Esq., has accepted the invitation of the Fairfax (Va.) Agricultural Society to deliver the address at the Annual Exhibition of that Society, on the 15th inst. . . . It is estimated that there are 800 railroad dépôts and stations in New-England. . . . A man named Murphy, at Bridgewater, Pa., was given an ounce of oxalic acid, by mistake, for salts, and was a corpse in eight minutes. . . . The deaths in Washington during August numbered 85, of which 18 were by cholera infantum, 8 consumption, 6 dysentery, 3 still-born; 48 were under 5 years of age, 15 were colored, and 41 were females and 36 males. . . . Stewart's celebrated "Marble Palace" in New-York has been enlarged, and now fronts 150 feet on Broadway. . . . Dr. G. A. Gardiner, accused of fraud against the Government, has voluntarily surrendered himself, and given bail in the sum of $40,000 for his future appearance. . . . To pickle cauliflower, or brocoli: keep them twenty-four hours in strong brine, and then take them out and heat the brine, and pour it on scalding hot, and let them stand until next day; drain and throw them into spiced vinegar. . . . It is believed that the crew of the American barque Coquette have been murdered by pirates off the coast of Formosa, where the vessel was probably shipwrecked. . . . In the British Museum are nine thick volumes composed entirely of title-pages. . . . To pickle peaches: take ripe but hard peaches, wipe off the down, stick a few cloves into them, and lay them in cold spiced vinegar; in three months they will be sufficiently pickled, and also retain much of their natural flavor. . . . The number of arrivals

by trains, vehicles, ferries, vessels, and foot, in a single day in Boston, was 43,080, and the number which left the city during the same time, 43,494; making in all 86,574 arrivals and departures. . . . An engine named the "Winnebago," built for the Galena and Chicago railroad, is entered to compete in the proposed iron-horse race at Lowell. . . . The rate of taxation in Gloucester is $1 23 on $100; in Rockport, $1 20; in Lynn, 86 cents; in Chelsea, 84 cents; in New-Bedford, 57 cents. . . . Lady Suffolk, a mare of some celebrity on the turf, is offered for sale, to close an estate, and rumor says $2,500 have been offered for her, but that is only half the sum her owner asks. . . . Goods acquired by industry prove commonly more lasting than lands by descent. . . . Mr. John Q. Hewlett, residing near Baltimore, raised this season seven hundred and eighty bushels of prime white wheat on a field containing 18 acres, 2 roods, and 6 perches—being a very small fraction under forty-two bushels per acre. . . . They are bragging over a pumpkin at Mobile which weighs 116 pounds. We should like to be entombed in a pie made of it, and have to eat our way out. . . . The entire wheat crop of Indiana last year was 6,457,965 bushels, worth $1,000,000 corn crop, 51,449,668, valued at $10,189,933. . . . The cranberry crop of Minnesota this year will be sufficiently abundant to supply the foreign as well as the home market. . . . The *Keene News* states that Mr. Elias Lyman of White River, Hartford, Vt., has a calf which on the 28th of May weighed 5,962½ pounds. He was then a little short of four years old. . . . The New-York and New-Haven Railroad Company, to obviate the annoyance of dust upon their road, have given several miles a top-dressing of oyster shells, and already the grass grows among them quite smartly. . . . The refinements of luxury in equipage or a table are perhaps not so often the gratifications of fancy as the consequence of an ambition to surpass and eclipse our equals. . . . The tavern bars in Lancaster, Pa., are to be closed on Sundays hereafter. . . . Mrs. S. J. Hale, in an article in *Godey's Book* for August, takes strong ground in favor of the practice of medicine by females. . . . The *Detroit Tribune* says the Conspiracy Trials have cost every daily paper in that city, for reporters and type-setting, over $800 each. . . . Dudley Leavitt, the veteran almanac maker, died at Meredith, N. H., on the 20th of Sept., aged 80 years. . . . A body of Norwegians, numbering about 220, passed Albany on the 18th, on their way westward, composed of men, women, and children. . . . To pickle onions: peel and boil them in milk and water ten minutes, drain off the milk and water, and pour scalded spiced vinegar on them. . . . A horned toad, the *Burlington* (N. J.) *Gazette* states, was dug up in a potato field near that place a few days ago, about four inches long, including the tail, with a body of considerable fatness, which is covered with innumerable horns. . . . It is only shallow-minded pretenders who either make distinguished origin a matter of personal merit, or obscure origin a matter of personal reproach. . . . It is rumored that the vacancy in the U. S. Associate Judgeship, occasioned by the death of Judge Woodbury, will be filled by Chief Justice Shaw of Massachusetts. . . . It is estimated that eight million pounds of wool have been sent to an Eastern market this season from the State of Ohio. . . . To pickle cherries: keep them in strong brine till they are yellow, then take them out and turn on spiced vinegar, and add a fresh supply of hot spiced vinegar. . . . The St. John papers state that on the 27th ult. a gale was experienced on the coast of Newfoundland, the like of which has not been known for the last fifty years. . . . Jesse Benjamin died at Clayton, Jefferson county, N. Y., on the 6th ult., aged 93. . . . Judge Beverly Tucker, Professor of Law at William and Mary College, died at Winchester on the 26th Aug., aged 67 years. . . . The *Burlington Gazette* states that Budd Holt assures them that he has a cow which produces 14¼ pounds of butter per week. . . . On Monday night, Aug. 18, twenty-seven valuable sheep, belonging to Nathaniel Hallock, of Milton, Ulster county, N. Y., were killed by dogs. . . . Messrs. Morse & Houghton, of Cleveland, Ohio, have 93 acres in one orchard. They have 6,500 peach trees of the best varieties, 2,000 apple,

400 cherry, 750 quince, and about 7,000 pear, apricot, nectarine plum trees, and grape vines. . . . To PICKLE green peppers: take the seeds out carefully, so as not to mangle them; soak them nine days in salt water, changing it every day, and keep them in a warm place; stuff them with chopped cabbage seasoned with cloves, cinnamon, and mace; put them in cold spiced vinegar. . . . A PARTY on Mount Washington, Tuesday, Sept. 16, found the summit covered with ice, from two to three inches thick, and long icicles hung from the boards that brace the staff. . . . THE Post-Office Department has recently decided that letters to postmasters directing them to forward letters to another Post-office address may go free of postage, being "official business." . . . THE New-York Board of Aldermen have voted to give $100 a year, for seven years, to the widows and families of police officers Gillespie and Foster, who were killed in doing their duty. . . . To take ink out of linen: take a piece of tallow, melt it, and dip the spotted part of the linen into the melted tallow; the linen may be washed, and the spots will disappear without injuring the linen. . . . AT the banquet in Paris recently, a fat ox was roasted whole, in order to gratify the British relish for roast beef. . . . AT the Lake of Killarney, in Ireland, there is an echo which plays an excellent *second* to any simple tune played on a bugle. . . . THE farmers in New-England complain bitterly of the want of rain. . . . IT is a sign of wisdom to be willing to receive instruction; the most intelligent sometimes stand in need of it. . . . THE block which the city of New-Bedford is to contribute to the Washington Monument is to bear the figure of the sperm whale. . . . IN 1849, there were consumed in the city of London, 240,000 bullocks, 1,700,000 sheep, and 28,000 calves, to say nothing of the pigs and poultry, together with game, of which one market alone furnished more than 4,000,000 head. . . . THE prospectus has been issued for a new Irish paper, to be published in Boston, under the title of the *Republican Age*. . . . THERE are three things in the world that know no kind of restraint, and are governed by no laws, but merely by passion and brutality: civil wars, family quarrels, and religious disputes. . . . A MAN was fined $40 and costs for killing four cat birds at Jamaica, L. I. . . . A SNEER is a poisoned arrow; a rebuke is a surgeon's knife. . . . THERE are about 60 Jewish synagogues in the United States, and about 100,000 Jews. . . . EVERY man magnifies the injuries he has received, and lessens those he has inflicted. . . . THE death of Mrs. Sally B. Gray, sister of the late President Taylor, is announced in the *Louisville Courier*. . . . THE city of Norfolk has agreed to subscribe $50,000 to the stock of the Gaston and Raleigh railroad, which secures the charter. . . . SURVEYS are now in progress for the construction of a railway between Christiana and Copenhagen, which will have the effect of bringing St. Petersburg three days' journey nearer London. . . . PROFESSOR JOHN WILSON, of the University of Edinburgh, the renowned Christopher North, has received a pension from the Government of £300. . . . HON. DANIEL WEBSTER, on his late White Mountain trip, stayed at Fabyan's over Sunday, and rode to a village, (Fryeburg,) near that place, to attend church, where he *kept his first school*. . . . A PARTY of about one hundred persons recently sung "Old Hundred" on the summit of Mount Washington. . . . HALIFAX papers state that the herring fishery along the coast of Nova Scotia has been an entire failure. . . . AT the head of the list of the Knights of the Legion of Honor, lately created by the President of the French Republic, is a widow by the name of Brulon, who was born in 1771. . . . THE expenses per annum to each person of the population in supporting the President of the United States, by paying his salary, is one ninth of a cent.; or four ninths for the term of four years. . . . DEATH once seen at our hearth, leaveth a shadow which abideth there for ever. . . . ACCORDING to the official statistics, the number of visitors to the Crystal Palace from May 1 to August 30, was 4,205,509. The fullest day was July 15; then there were 74,122 persons in the building. . . . IN the Hotel des Invalides in Paris there are 3,076 pensioners. Of these 1,450 are between 60 and 80 years of age; 959 are close upon the latter number, 80; and 90 very near their 100th birth-day.